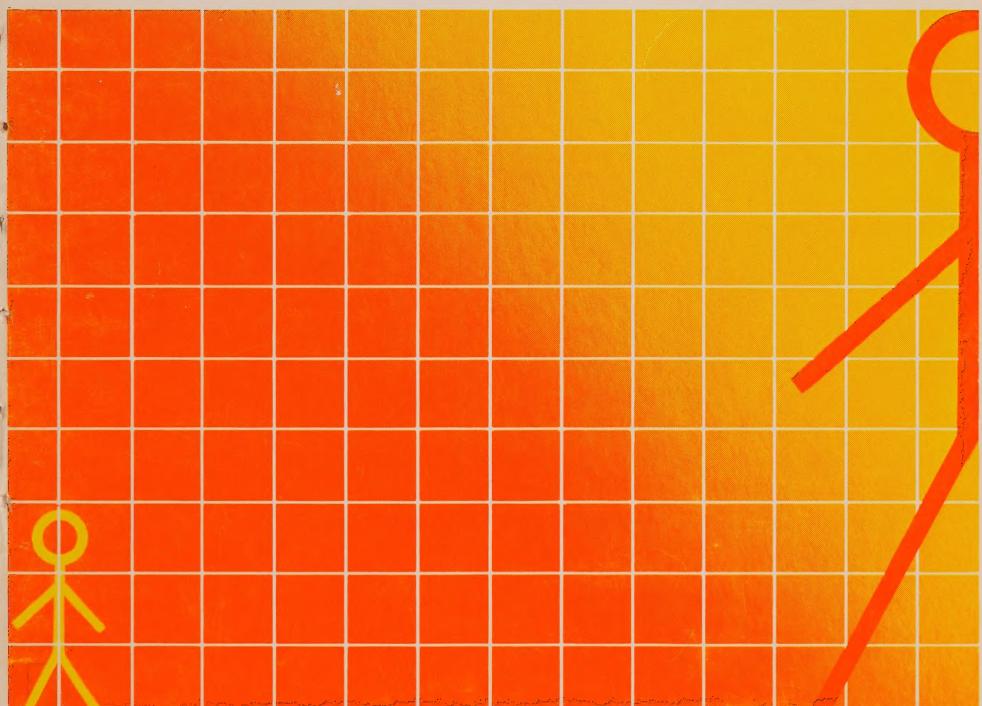


short-term variations in student and non-student labour force participation rates, 1966-73



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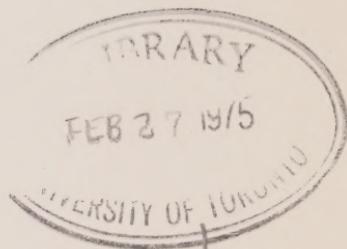
SPECIAL LABOUR FORCE STUDIES

Series B, No. 6

SHORT-TERM VARIATIONS IN STUDENT AND NON-STUDENT
LABOUR FORCE PARTICIPATION RATES, 1966-73

by

Nicole Gendreau



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FOREWORD

This publication is the sixth in a series (Series B) of Special Labour Force Studies. It first establishes the respective participation rates for students and non-students in the 14-24 age group. These estimates are used to determine the impact of seasonal and cyclical fluctuations in demand for labour on the supply of student and non-student labour between 1966 and 1973.

This study was prepared under the guidance of Helen Buckley, Coordinator, Manpower Research and Development Section, Labour Division.

Responsibility for the interpretation and analysis of data belongs to the author rather than to Statistics Canada.

SYLVIA OSTRY,
Chief Statistician of Canada.

PREFACE

An analogous study covering the period 1966-72 was submitted for a Master's degree at the University of Montreal's *École des relations industrielles*. I wish to extend my thanks to Professor Gérard Hébert, who directed my research, and the *École des relations industrielles*, which granted me permission to publish the results of these efforts.

I must also mention the contribution made by Christiane Talbot of the Manpower Research and Development Section. To her I offer my heartfelt thanks for her unfailing readiness to discuss the statistical problems associated with this empirical study. I also wish to thank Frank J. Whittingham of Statistics Canada for reviewing the entire manuscript and making a number of constructive suggestions.

Nicole Gendreau.

March, 1974

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INTRODUCTION AND SUMMARY

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Introduction

The debate over the impact of short-run fluctuations in the demand for goods and services on the supply of labour has a long history in the literature of economics. One of the basic arguments in this area, the additional worker hypothesis put forward by Woytinski,¹ predicts that a decline in demand forces secondary workers into the labour market to maintain family income. A second argument, the discouraged worker hypothesis attributed to Paul H. Douglas,² holds that workers will tend to become discouraged and withdraw from, or stay out of, the labour force when demand declines. The contradiction between these hypotheses was subsequently resolved by recognizing that both phenomena may be present simultaneously with only the net effect being measurable.³ Further, if the two effects are of similar magnitude, the level of labour force participation would show no variation in response to cyclical swings in demand.

While there have been numerous studies on the impact of cyclical fluctuations in economic conditions on participation rates,⁴ little attention has been devoted to the relationship between seasonal swings in demand and labour force participation rates. The task in this study is to identify separately the influence of seasonal and cyclical demand fluctuations on the level of labour force participation.

The analysis is restricted to persons 14-24 years of age. One would expect secondary workers, i.e., those who have an intermittent labour force attachment, to comprise an important component of this age group.

In the first chapter seasonal and cyclical demand components are discussed and a model is specified. This is followed by a detailed discussion in Chapter II of the method employed to construct a time series on labour force participation rates for students and non-students within the 14-24 age category. Enrolment rates are analyzed in Chapter III and student and non-student labour force participation rates are examined in Chapter IV. The results of empirical tests are presented in Chapter V and the conclusions of the study constitute Chapter VI.

¹ W.S. Woytinski, *Additional Workers and the Volume of Unemployment in the Depression*, Committee on Social Security, Pamphlet Series No. 1 (Social Sciences Research Council, Washington 1940).

² Paul H. Douglas, *The Theory of Wages*, Reprints of Economic Classics (New York: Sentry Press, 1964), pp. 229-314.

³ W. Lee Hansen, "The Cyclical Sensitivity of the Labor Supply", *American Economic Review* (June 1961), pp. 299-309.

⁴ For a review of these studies see Jacob Mincer, "Labor Force Participation and Unemployment, A Review of Recent Evidence", *Prosperity and Unemployment*, Robert A. Gordon and Margaret S. Gordon (eds.) (New York: John Wiley and Sons Inc., 1966), pp. 73-112.

Summary

This study supports the view that the “discouraged worker” and “additional worker” hypotheses may be useful for analyzing the impact of seasonal demand swings on labour supply. Also, it appears that such a seasonal shortfall in demand will result in an “additional worker” effect only very rarely. The analysis also demonstrates that non-students are driven out of the labour market by a cyclical shortfall in demand and students, under the same conditions, are driven into the labour market in order to supplement family income.

While over the period studied, 1966 to 1973, there was an upward trend in student participation rates and a downward trend in the rates for non-students among the 20-24-year olds, within this period there were strong cyclical demand effects. Student labour market participation reacted strongly to rising unemployment, with a 1% rise in the unemployment rate triggering an increase of greater than 1% in the student participation rate. In the case of non-student participation rates, the reaction was not only weaker but negative as well.

CHAPTER I CONCEPTUAL BACKGROUND

This empirical study deals with the aggregate supply of labour represented by the labour force participation rate, which is the proportion of the civilian non-institutional population in the labour force. It is based on a statistical measure of supply at a specific time representing here the labour supply as a macroeconomic and even macrosociological phenomenon, defined mostly by the institutional and legislative environment. This time series study measures the impact of demand on supply.

Seasonal and Cyclical Demand

The question immediately arises: what features do seasonal and cyclical demand factors have in common with respect to their impact on labour supply? Either one may result in a net "additional worker" or "discouraged worker" effect. If the "additional worker" effect predominates, the participation rate will display a counter-seasonal and counter-cyclical trend, while if the "discouraged worker" effect is the stronger, participation rates that parallel declining seasonal and cyclical demand patterns will point to hidden unemployment. Up to a point, this response to changes in demand may also be interpreted as flexibility on the part of the labour force reacting to demand pressures with optimal timing.⁵ This interpretation draws on the concept of a reserve labour force⁶ which may be either seasonal or cyclical.

However, while seasonal and cyclical reactions may give rise to similar effects, they differ in several aspects. The seasonal labour demand factor is more regular and the public at large is much more widely aware of it. It might be thought that because of these factors the seasonal reaction would be stronger and more regular than the cyclical reaction. On the other hand, the seasonal factor is of much shorter duration and, financially speaking, the period of slackened demand can be weathered more easily. In addition, the short duration of a seasonal decline in demand means that there is relatively little of the discouragement and decay of skills typically associated with a cyclical decline.⁷ Optimal timing will thus account for a greater part of the seasonal than of the cyclical reaction.

It should be noted that although the two types of reaction rely on very similar arguments, they cannot necessarily be expected to operate in the same direction. It is not difficult to visualize a seasonal "discouraged worker" reaction occurring along with a cyclical "additional worker" effect. These opposing reactions may be generated by the difference in duration of the demand decline and the impact on family income.

In brief, the participation rate can safely be said to respond on a seasonal basis to the same types of behaviour (discouraged worker and additional worker) that cause it to respond on a cyclical basis, so that the task of the present study is to measure the links between participation rates and seasonal and cyclical fluctuations in labour demand.

⁵ Jacob Mincer, *op. cit.*, pp. 100-105.

⁶ Pierre-Paul Proulx, "La variabilité cyclique des taux de participation à la main-d'œuvre au Canada", *Canadian Journal of Economics* (May 1969), p. 270.

⁷ Joseph M. Bonin and W.Y. Davis, "Labor Force Responsiveness to Short-Run Variation in Economic Opportunity", *The Southern Economic Journal*, XXXVIII, No. 2 (October 1971), p. 163.

Student and Non-student Status

To be realistic, an analysis of variation in labour force participation in response to fluctuations in demand for younger persons must allow for separate identification of students and non-students.⁸ The school attendance factor is crucial in view of the differences to be expected in the behaviour of students and non-students. Non-student behaviour is more likely to approximate that of primary workers since working is the major activity for this group. One would expect the labour force attachment of a younger person who has left school to be strong enough to keep economic conditions from influencing his decision whether to enter or leave the labour force. For students, however, working is a secondary activity and, consequently, labour supply for this group will be characterized by greater elasticity. The behaviour of the student group should react more strongly to economic conditions.

When a time series of participation rates is studied for the total 14-24 age group, the effect of the enrolment rate (that percentage of the population constituted by students) may cloud the analysis. If enrolment rates have changed over the years, student behaviour at the beginning of the period under review will not have the same weight that it has in the terminal years. A change in the overall participation rate may be the result of a change in the student/non-student ratio within the group rather than reflect a genuine change in the pattern of labour force participation. Further, not only may student/non-student composition have altered during the period, but different behaviour by the two groups may cancel out with the result that little or no change is observable for the age-sex grouping as a whole, in spite of considerable movement on the part of both the student and non-student components. Lastly, behaviour of the overall participation rates during the period may indicate a modified trend if the rates for the two groups have in fact tended to move in different directions. Student participation rates, for example, may have risen during the period while non-student rates were tending to decline, like the rates for men in the 25-44 age group.⁹ In this case participation rates for the 14-19 age group would display an upward trend, since students constitute the majority of this age group, while for the 20-24 age group the overall trend would be downward, the proportion of students in this group being much smaller.

There are no regularly produced Canadian data on participation rates which take student status into account. To establish homogeneity within the groups under review and to be in a position to undertake an analysis in greater depth, it was necessary to calculate participation rates for students and non-students separately by using information on major and secondary activity collected each month in Statistics Canada's Labour Force Survey. This survey, which is carried

⁸ Nicole Gendreau, "Youth Participation in the Labour Force, 1953-70", *Notes on Labour Statistics, 1971*, Statistics Canada (Catalogue 72-207, Annual) (Ottawa: Information Canada, 1972), p. 19.

⁹ *Seasonally Adjusted Labour Force Statistics*, Statistics Canada (Catalogue 71-201, Annual) (Ottawa: Information Canada, 1972), p. 201.

out by interviews in approximately 35,000 households, is based on stratified multilevel sampling.¹⁰ During the period under review (1966-73) the sample homes included between 18,000 and 23,000 young persons in the 14-24 age group. They served as the base for the 4 million young persons with whom this study is concerned. In the course of the interview the interviewer determines activities and other characteristics that are necessary for the monthly survey. The questionnaire used in the survey is given in Appendix A and the procedure used to derive labour force participation rates by student status from the survey data is discussed in Chapter II.

Specification of the Model

In theory, when specifying a model to measure the effect of demand on supply, one should include a complete measure of supply and a complete measure of demand. Also, these measures should be specific for each group studied and should be statistically independent.¹¹ For the period under review, however, such measures do not exist even at an aggregate level, let alone for a specific population group. Consequently, it is necessary to use approximate measures.

As already indicated, the labour force participation rate (the proportion of the population who is either working or looking for work) will be used as the measure of supply. On the demand side, one can choose from alternative measures. For some studies employment (a measure of filled demand) has been used to approximate demand for labour.¹² In this study the unemployment rate is chosen to measure labour demand conditions.

The use of this measure, however, creates a statistical problem. Since the measures of supply and demand are drawn from the same source, the Labour Force Survey, and the labour force is defined as the sum of employed plus unemployed, there is a risk of defining a tautological relationship.¹³ This problem can be avoided by using the unemployment rate for men in the 25-44 age group. Used as a measure of demand this variable would not be specific for the group under review and should serve as a general measure of the labour demand level. Males in this age group have a very strong labour force attachment and little propensity to move out of the labour force when demand conditions deteriorate.

¹⁰ An explanation of the sampling may be found in *Canadian Labour Force Survey (Methodology)*, Statistics Canada (Catalogue 71-504, Occasional) (Ottawa: Information Canada, 1966).

¹¹ David S. Huang, *Regression and Econometric Methods*, Wiley Series in Probability and Mathematical Statistics (New York: John Wiley and Sons Inc., 1970), p. 15.

¹² Alfred Tella, "The Relation of Labor Force to Employment", *Industrial and Labor Relations Review*, XVII, No. 3 (April 1964), pp. 454-469; T.F. Dernburg and K.T. Strand, "Hidden Unemployment 1953-62: A Quantitative Analysis by Age and Sex", *The American Economic Review*, LVI, No. 1 (March 1966), p. 73; Arthur D. Butler and George D. Demopoulos, "Labor Force Behaviour in a Full Employment Economy", *Industrial and Labor Relations Review*, XXIV, No. 3 (April 1971); Pierre-Paul Proulx, *op. cit.*, p. 270.

¹³ The unemployment rate expresses the ratio of unemployed to the sum of the labour force (i.e., employed and unemployed) to the whole population. Thus, if unemployed persons only were to leave the labour force, participation and unemployment rates would decline tautologically.

Formulating the nature of the relationships among variables in a model is necessarily an arbitrary procedure.¹⁴ The model that is specified is linear in the parameters and the variables, i.e., of the form:

$$Y = B_0 + B_1 X_1 + B_2 X_2 + \dots + B_k X_k + u$$

This specification implies that seasonal and cyclical demand are largely independent, which may not be strictly true, but it appears to be a reasonable approximation of reality. The variables are quantitative and considered to be continuous since the three variables in our model — participation rate, seasonal demand and cyclical demand — may be interpreted as points taken from a continuum.

The model takes the form:

$$PR = a_0 + a_1 SF + a_2 CU + e$$

where PR is the participation rate,

SF is the seasonal element of unemployment,

CU is the unemployment rate for males in the 25-44 age group and

e is the error term.

Since the unemployment rate varies inversely with the demand for labour, a positive coefficient for the variables SF and CU will indicate predominance of the "additional worker" effect while a negative coefficient will indicate that the "discouraged worker" effect is the more prominent.

We have also introduced lags of 2, 6, and 12 months for CU, the cyclical demand variable. The introduction of these lags enables the relationship between cyclical demand and the participation rate to be more closely defined. The use of lags offers the additional advantage of reducing correlation in the residuals which often presents a problem in models of this type.¹⁵ As far as interpretation goes, some lag in the reaction of labour force behaviour is entirely plausible since a cyclical trend cannot be appreciated instantaneously by the labour force.

By introducing lags for CU the relationship becomes:

$$PR = a_0 + a_1 SF + a_2 CU_{-2} + a_3 CU_{-6} + a_4 CU_{-12} + e$$

where the symbols have the same meaning as in the previous model and where

CU_{-2} , CU_{-6} and CU_{-12} are unemployment rates for men
in the 25-44 age group with lags of 2, 6 and 12 months
respectively.

¹⁴ This is often the case in the field of economics. See Huang, *op. cit.*, p. 14 and J. Johnston, *Econometric Methods* (New York: McGraw-Hill, 1963), p. 7.

¹⁵ S.F. Kaliski, *The Relationship Between Labour Force Participation and Unemployment in Canada: Interim Report on a Pilot Study*, paper presented to the Political Science Association Conference on Statistics (McMaster University, June 1962).

An explanation of the measures used will be found in Chapter V. The coefficients of the model are calculated with a backwards stepwise regression program¹⁶ which is a modified version of Efroymson's algorithm.¹⁷

Lastly, the empirical tests are based on the time period 1966 to 1973. It would have been desirable to apply the model to a longer period for the sake of greater completeness but the use of monthly Labour Force Survey tapes to construct the dependent variables restricted the analysis to the period for which these tapes were operational.

¹⁶ This procedure is employed to determine the 1, 2, 3, . . . n best regressors for the model. The program first takes all the variables specified and rejects the weakest variables one at a time, recalculating at each step to minimize error variance. The minimum value of whatever partial F is acceptable must be specified. The equation ultimately obtained is such that all variables in it have a partial F that is higher than the specified level.

¹⁷ M.A. Efroymson, *Mathematical Methods for Digital Computers*, Rolsten and Wilf (eds.) (New York: Wiley and Sons Inc., 1960), Chapter 17.

CHAPTER II

PARTICIPATION RATES FOR STUDENTS AND NON-STUDENTS

As noted in Chapter I participation rates by student and non-student status are necessary for an adequate analysis. In this chapter the method used to construct these rates from labour force survey data is described and checks are made on the validity of the estimates.

Information on School Attendance in the Monthly Labour Force Survey

The monthly Labour Force Survey elicits information about the major and secondary activities of the population for the reference week via questions 11 and 12.¹⁸ The main primary activities indicated are: working, looking for work, had a job but did not work, housekeeping, and attending school (see Appendix A). The presence of the category "attending school" is not in itself adequate to establish the respondent's status as a student (or non-student) because the nature of the course of study is not a factor used to define the concept of "attending school". Thus, a person taking courses for cultural or recreational purposes may be considered as "attending school".¹⁹

Not only is the nature of the course of study left out of account, but also the instructions given to interviewers nowhere state that by "major activity" is to be understood the activity which occupies the greatest number of hours of the respondent's time or that "secondary activity" implies the activity with which the respondent is less concerned as determined by application of the same standard. The instructions seek to determine the respondent's status in terms of the labour market. They are adequate for this purpose since the numbers of individuals who are employed, unemployed, or not part of the labour force are established in the light of the answers given to both questions 11 and 12, not in the light of the answer given to one or the other. Accordingly, if a person indicates "house-keeping" as his or her major activity (question 11) but indicates "working" as his or her secondary activity (question 12), that person is included in the labour force. The questions are not designed to determine the size of the student population.

Validity Test for the "Attending School" Response in the Monthly Survey

To determine the validity of using information on major and secondary activities to calculate labour force participation rates by student status it is necessary to establish the degree of correlation between respondents with "attending school" as their major activity and the full-time student population, and between those who indicate "attending school" as their secondary activity and the part-time student population.

¹⁸ Question 11 asks "What did this person do mostly last week?" and question 12 "Did this person do anything else last week?".

¹⁹ *Interviewer's Manual for the Labour Force Survey*, unpublished, Statistics Canada, Section 5, pp. 2-7.

The following hypothesis is used for this purpose: it is supposed that nearly all individuals who report "attending school" as their major activity and "working" as their secondary activity will have worked less than 25 hours during the survey reference week.²⁰ In addition, individuals who indicate "working" as their major activity and "attending school" as their secondary activity will have more than 35 hours of work to their credit, i.e., will have worked full time.

By distributing the data on major and secondary activities by number of hours worked the following results were obtained: 93% of the respondents "attending school" as their major activity and "working" as their secondary activity had less than 25 hours of work to their credit and only 2% of them worked 35 hours or more. The first part of the hypothesis is confirmed and the respondent's major activity can be used to determine student or non-student status. However, 33% of the individuals who reported "working" as their major activity and "attending school" as their secondary activity worked less than 35 hours. Thus, it is necessary to discard the second part of the hypothesis and, consequently, major and secondary activities cannot be used to approximate student or non-student status.

Both interviewer and respondent are aware that the primary purpose of the survey is to obtain data pertaining to the labour market and, accordingly, will tend to record or indicate the activity in terms of the "work" aspect rather than the "studies" aspect. This may be the case even if the respondent's studies constitute his major activity in terms of the number of hours devoted to it. As noted above, the terms "major" and "secondary" are not defined in the instructions given to the interviewer and, accordingly, the question of which activity is major and which secondary is left to the respondent's discretion. To avoid these difficulties decision tables were developed for obtaining a student - non-student distribution of the 14-24-year olds.

Decision Tables

The classification of the 14-24-year olds into "student" and "non-student" categories was determined by two decision tables. These were drawn up on the basis of answers to the monthly labour force survey questionnaire. The same questions were used in both decision tables but in a different order which, thereby, altered the logic of the decision. The questions employed were the ones dealing with major and secondary activities (questions 11 and 12 which were mentioned above), number of hours worked during the reference week (question 13), attempt to find a part- or full-time job (question 15)²¹ and lastly, usual number of working hours per week (question 20).²²

²⁰ Question 13 asks "How many hours did this person work last week?".

²¹ Question 15 asks "Did this person look for full-time or part-time work last week?".

²² Question 20 reads as follows: "Does this person usually work 35 hours or more at his present job?".

In Decision Table No. 1 the first question deals with major activity (see Table 1). All respondents with "attending school" as major activity are considered "students", regardless of what they report as their secondary activity. This approach was adopted in accordance with the results obtained from testing the hypothesis put forward in the previous section. When anything but "attending school" is indicated for both major and secondary activities the individual is a "non-student", since there is no basis on which he can be classified as a "student".

TABLE 1. Decision Table No. 1¹

Decision criteria	Decision steps							
Major activity attending school	Y	N	N	N	N	N	N	N
Secondary activity attending school	-	N	Y	Y	Y	Y	Y	Y
Number of working hours 35-99	-	-	Y	N	N	N	N	N
Seeking full-time work	-	-	-	Y	N	N	N	N
Seeking part-time work	-	-	-	-	Y	N	N	N
Number of hours usually worked 35 or more	-	-	-	-	-	Y	N	N
Number of hours usually worked under 35	-	-	-	-	-	-	Y	N
Other	-	-	-	-	-	-	-	Y
Category in which respondent is classified:								
In-school population	X				X	X	X	
Out-of-school population		X	X	X		X	X	X

¹ "Y" indicates an affirmative reply to the criterion; "N" indicates a negative reply; and "X" denotes membership in the corresponding category.

² Includes permanent inability to work, housekeeping, retired, etc., as "major activities" and attending school as "secondary activity".

Lastly, when "attending school" is indicated as the respondent's secondary activity the "number of hours" standard is applied in accordance with the requirements of individual cases. The decision is based on the answers provided to the questions dealing with number of hours worked (if the respondent worked), type of work sought (if he was unemployed) and usual number of working hours (if he had a job but was not at work), as described in the decision table.

In this first decision table answers to the questions that deal with major and secondary activities are very important.

Over 98% of all respondents were classified by means of these two variables (see Table 3, column 4). The use of the other variables may be considered marginal since they cover less than 2% of all cases. The fact that the overwhelming majority (approaching 100%) of all respondents were classified using two variables only led to the design of a second decision table to compare the results obtained when the importance of the answers provided to questions 11 and 12 is reduced to a minimum. This alternative gives maximum scope to the "number of hours" standard.

The second decision table (see Table 2) involves a different logic. Answers to the questions dealing with major and secondary activities come to the fore only to the extent that they serve to classify individuals in the "non-student" group. When "attending school" is indicated as a respondent's major or secondary activity an attempt is made to classify the individual first by using the "number of hours" standard and, failing this, by means of the activities indicated as major or secondary. As a result, this second decision table classifies initially as "non-students" all respondents who do **not** report "attending school" as either their major or their secondary activity. Subsequently, using the answers elicited by the questions dealing with number of hours worked during the reference week in the case of respondents who are employed, the type of work sought (full-time or part-time) in the case of those who are unemployed, and the usual number of working hours in the case of those who have jobs but did not work during the reference week, the individual may be classified as "student" or "non-student". For cases that cannot be classified by using information on these characteristics information on major activity is re-checked. When the major activity is given as "attending school" the individual is a student; otherwise, he is a non-student.

TABLE 2. Decision Table No. 2¹

Decision criteria	Decision steps							
Major activity attending school	N	-	-	-	-	-	-	-
Secondary activity attending school	N	-	-	-	-	-	-	-
Number of working hours 35-99	-	Y	N	N	N	N	N	N
Number of hours usually worked 35 or more	-	-	Y	N	N	N	N	N
Number of hours usually worked under 35	-	-	-	Y	N	N	N	N
Seeking full-time work	-	-	-	-	Y	N	N	N
Seeking part-time work	-	-	-	-	-	Y	N	N
Major activity attending school	-	-	-	-	-	-	Y	N
Major activity other than attending school	-	-	-	-	-	-	-	Y
Category in which respondent is classified:								
In-school population	X	X	X	X	X	X	X	X
Out-of-school population								

¹ "Y" indicates an affirmative reply to the criterion; "N" indicates a negative reply; and "X" denotes membership in the corresponding category.

This second approach was adopted to determine whether it was preferable to give priority to the activities indicated as major and secondary or to stress the "number of hours" criteria. As can be seen from Table 3, column 4, however, the approach left nearly 91% of the cases to be classified according to major and secondary activities.

Validity Test of Decision Tables

The validity of the results yielded by the decision tables were checked for 1 month by making comparisons against information on student status collected through a set of special questions appended to the regular labour force survey schedule in April 1971.²³ The questions determined whether the individual was attending school and, if so, whether he was enrolled on a full-time or part-time basis. All those attending school on a full-time basis were considered to be students. The validity test, therefore, involves a comparison between the results yielded by the decision tables and the student or non-student status of individuals as established by means of the additional questions.

At each step in the decision-making process the decisions made were checked and the correctness of each confirmed. The population was classified by sex and age (into 14-19 and 20-24 age groups) for purposes of analysis.

It is important to note that error rates calculated in this fashion are maximum rates since the classification was checked for correctness at the individual response level with no compensation effect allowed on an overall basis. The latter would have resulted from a count of the total number of students and non-students as yielded by the decision tables on the one hand and by the special survey on the other.

Also, in this check, an individual's status as indicated by the response elicited by the supplementary questions is considered to be his true status. Thus, whenever there is a discrepancy between the results derived from the decision tables and those of the special survey an error is recorded. The weight assigned to the individual record in which the error occurs (the monthly survey is based on a sample) is then applied to the error itself for the purpose of obtaining results at the estimate level. Test results are given in Table 3 for the total population and Tables 4 and 5 for women in the two age groups based on Decision Tables No. 1 and 2 respectively. In Tables 6 and 7 the results of tests for males are presented on the basis of Decision Tables No. 1 and 2 respectively.

²³ The questions asked respectively: "Are you currently attending school? " and, if so, "Are you enrolled on a full-time or part-time basis? ". See also Appendix B for a description of this supplementary survey.

TABLE 3. Results of Validity Test for Decision Tables, 14-24 Years, Both Sexes

Name of variable	Correct decisions	Incorrect decisions	Total decisions	Percentage of total number of decisions	Error rate	Cases with no decision
number						number
Decision Table No. 1:						
Major activity attending school	2,193,304	48,955	2,242,259	50.9	2.2	2,165,367
Major and secondary activities other than attending school	2,050,259	39,463	2,089,722	47.4	1.9	75,645
Number of working hours 35-99	29,823	7,531	37,354	0.8	20.2	38,291
Seeking full-time work	3,763	1,621	5,384	0.1	30.1	32,907
Seeking part-time work	146	156	302	0.0	51.7	32,605
Number of hours usually worked 35 or more	9,678	1,462	11,140	0.3	13.1	21,465
Number of hours usually worked under 35	13,231	5,091	18,322	0.4	27.8	3,143
Other	2,498	645	3,143	0.1	20.5	0
Total	4,302,702	104,924	4,407,626	100.0	2.4	—
Decision Table No. 2:						
Major and secondary activities other than attending school	2,050,259	39,463	2,089,722	47.4	1.9	2,317,904
Number of working hours 35-99	30,472	19,595	50,067	1.1	39.1	2,267,837
Seeking full-time work	6,387	12,855	19,242	0.4	66.8	2,248,595
Seeking part-time work	11,542	312	11,854	0.3	2.6	2,236,741
Number of hours usually worked 35 or more	9,481	4,673	14,154	0.3	33.0	2,222,587
Number of hours usually worked under 35	314,761	11,980	326,741	7.4	3.7	1,895,846
Major activity attending school	1,858,409	34,294	1,892,703	42.9	1.8	3,143
Secondary activity other than attending school	2,498	645	3,143	0.1	20.5	0
Total	4,283,809	123,817	4,407,626	100.0	2.8	—

TABLE 4. Results of Validity Test for Decision Table No. 1, Females by Age

Name of variable	Correct decisions	Incorrect decisions	Total decisions	Percentage of total number of decisions	Error rate	Cases with no decision
number						number
Female, 14-19 years:						
Major activity attending school	905,921	16,182	922,103	74.5	1.8	314,893
Major and secondary activities other than attending school	290,340	13,974	304,314	24.6	4.6	10,579
Number of working hours 35-99	3,932	433	4,365	0.4	9.9	6,214
Seeking full-time work	336	358	694	0.1	51.6	5,520
Seeking part-time work	—	—	—	—	—	—
Number of hours usually worked 35 or more	651	433	1,084	0.1	39.9	4,436
Number of hours usually worked under 35	3,584	777	4,361	0.4	17.8	75
Other	75	—	75	0.0	—	0
Total	1,204,839	32,157	1,236,996	100.0	2.6	—
Female, 20-24 years:						
Major activity attending school	94,883	3,993	98,876	10.7	4.0	826,357
Major and secondary activities other than attending school	810,788	2,098	812,886	87.9	0.3	13,471
Number of working hours 35-99	4,799	—	4,799	0.5	—	8,672
Seeking full-time work	—	—	—	—	—	—
Seeking part-time work	—	156	156	0.0	100.0	8,516
Number of hours usually worked 35 or more	2,621	—	2,621	0.3	—	5,895
Number of hours usually worked under 35	594	2,233	2,827	0.3	79.0	3,068
Other	2,423	645	3,068	0.3	21.0	0
Total	915,108	9,125	925,233	100.0	1.0	—

TABLE 5. Results of Validity Test for Decision Table No. 2, Females by Age

Name of variable	Correct decisions	Incorrect decisions	Total decisions	Percentage of total number of decisions	Error rate	Cases with no decision
number						number
Female, 14-19 years:						
Major and secondary activities other than attending school	290,340	13,974	304,314	24.6	4.6	932,682
Number of working hours 35-99	3,932	1,844	5,776	0.5	31.9	926,906
Seeking full-time work	580	3,186	3,766	0.3	84.6	923,140
Seeking part-time work	3,189	—	3,189	0.3	—	919,951
Number of hours usually worked 35 or more	—	1,917	1,917	0.2	100.0	918,034
Number of hours usually worked under 35	113,948	3,031	116,979	9.5	2.6	801,055
Major activity attending school	792,646	8,334	800,980	64.8	1.0	75
Secondary activity other than attending school	75	—	75	0.0	—	0
Total	1,204,710	32,286	1,236,996	100.0	2.6	—
Female, 20-24 years:						
Major and secondary activities other than attending school	810,788	2,098	812,886	87.8	0.3	112,347
Number of working hours 35-99	4,799	838	5,637	0.6	14.9	106,710
Seeking full-time work	1,461	—	1,461	0.2	—	105,249
Seeking part-time work	212	156	368	0.0	42.4	104,881
Number of hours usually worked 35 or more	2,621	—	2,621	0.3	—	102,260
Number of hours usually worked under 35	8,629	3,456	12,085	1.3	28.6	90,175
Major activity attending school	84,337	2,770	87,107	9.4	3.2	3,068
Secondary activity other than attending school	2,423	645	3,068	0.3	21.0	0
Total	915,270	9,963	925,233	100.0	1.1	—

TABLE 6. Results of Validity Test for Decision Table No. 1, Males by Age

Name of variable	Correct decisions	Incorrect decisions	Total decisions	Percentage of total number of decisions	Error rate	Cases with no decision
number						number
Male, 14-19 years:						
Major activity attending school	997,348	17,008	1,014,356	78.0	1.7	285,523
Major and secondary activities other than attending school	250,891	17,999	268,890	20.7	6.7	16,633
Number of working hours 35-99	2,916	3,696	6,612	0.5	55.8	10,021
Seeking full-time work	1,988	243	2,231	0.2	10.9	7,790
Seeking part-time work	—	—	—	—	—	—
Number of hours usually worked 35 or more	1,469	355	1,824	0.1	19.5	5,966
Number of hours usually worked under 35	4,869	1,097	5,966	0.5	18.4	0
Other	—	—	—	—	—	—
Total	1,259,481	40,398	1,299,879	100.0	3.1	—
Male, 20-24 years:						
Major activity attending school	195,152	11,772	206,924	21.9	5.7	738,594
Major and secondary activities other than attending school	698,240	5,392	703,632	74.4	0.8	34,962
Number of working hours 35-99	18,176	3,042	21,578	2.3	15.8	13,384
Seeking full-time work	1,439	1,020	2,459	0.3	41.5	10,925
Seeking part-time work	146	—	146	0.0	—	10,779
Number of hours usually worked 35 or more	4,937	674	5,611	0.6	12.0	5,168
Number of hours usually worked under 35	4,184	984	5,168	0.5	19.0	0
Other	—	—	—	—	—	—
Total	922,274	23,244	945,518	100.0	2.5	—

TABLE 7. Results of Validity Test for Decision Table No. 2, Males by Age

Name of variable	Correct decisions	Incorrect decisions	Total decisions	Percentage of total number of decisions	Error rate	Cases with no decision
number						
Male, 14-19 years:						
Major and secondary activities other than attending school	250,891	17,999	268,890	20.7	6.7	1,030,989
Number of working hours 35-99	3,565	12,627	16,192	1.2	78.0	1,014,797
Seeking full-time work	2,352	4,329	6,681	0.5	64.8	1,008,116
Seeking part-time work	7,012	—	7,012	0.5	—	1,001,104
Number of hours usually worked 35 or more	1,658	1,772	3,430	0.3	51.7	997,674
Number of hours usually worked under 35	168,813	2,639	171,452	13.2	1.5	826,222
Major activity attending school	811,958	14,264	826,222	63.6	1.7	0
Secondary activity other than attending school	—	—	—	—	—	—
Total	1,246,249	53,630	1,299,879	100.0	4.1	—
Male, 20-24 years:						
Major and secondary activities other than attending school	698,240	5,392	703,632	74.6	0.8	241,886
Number of working hours 35-99	18,176	4,286	22,462	2.4	19.1	219,424
Seeking full-time work	1,994	5,340	7,334	0.8	72.8	212,090
Seeking part-time work	1,129	156	1,285	0.1	12.1	210,805
Number of hours usually worked 35 or more	5,202	984	6,186	0.6	15.9	204,619
Number of hours usually worked under 35	23,371	2,854	26,225	2.8	10.9	178,394
Major activity attending school	169,468	8,926	178,394	18.9	5.0	0
Secondary activity other than attending school	—	—	—	—	—	—
Total	917,580	27,938	945,518	100.0	3.0	—

TABLE 8. Enrolment Rates as Arrived at by the Decision Method and as Established by the Special Survey, With Compensation Effect Permitted, by Sex and Age, April 1971

Sex and age	Percentage of full-time students	
	Results of decision table no. 1	Results of the special survey
Both sexes:		
14-19 years	76.7	76.8
20-24	16.8	16.5
14-24	51.3	51.2
Female:		
14-19 years	74.9	74.8
20-24	11.0	10.6
14-24	47.6	47.3
Male:		
14-19 years	78.5	78.8
20-24	22.4	22.2
14-24	54.9	55.0

Using Decision Table No. 1, 2.4% of the decisions turned out to be incorrect. This is the maximum possible discrepancy for the month of April 1971. It includes all cases which were wrongly classified, i.e., individuals indicating that they attended school full-time who were classified as "non-students" or individuals indicating that they did not attend school full-time who were classified as "students".

A certain number of these errors will cancel out. Table 8 shows the net error level involved in using Decision Table No. 1. Regardless of age-sex grouping, net error is always less than 0.5%.

These tests demonstrate that "students" can be accurately distinguished from "non-students" by the use of Decision Table No. 1, and that the procedure yields a school enrolment rate that closely approximates the "actual" rates obtained by means of the supplementary labour force survey questions. As a result Decision Table No. 1 was applied to all available operational tapes, i.e., the data from 1966 to 1973, to distribute 14-24-year olds by student and non-student status.²⁴ Only the months of the academic year (January-May and October-December) were used for this transformation. The summer months had to be rejected because the schools are closed during that part of the year. After the results had been studied the months of May, June, and September were excluded as well. The in-school period is shorter for a large number of students, notably in the 20-24 age group, and this had a considerable impact on enrolment and participation rates.

A review and analysis of the enrolment rates that were obtained is presented in the following chapter. Enrolment rates are of particular interest in the context of a study devoted to participation rates because student or non-student status is an important participation level determinant in these age groups. In addition, studies have shown that there is a relationship between the unemployment rate and the school attendance rate.²⁵

²⁴ Unemployment rates for non-students as calculated on the basis of these data will be found in Appendix E.

²⁵ Beverly Duncan, "Dropouts and the Unemployed", *Journal of Political Economy* (April 1965), pp. 121-34. Also see W.G. Bowen and T.A. Finegan, *The Economics of Labor Force Participation* (Princeton: Princeton University Press, 1969), Chapters 12-14.

CHAPTER III

ENROLMENT RATES

A Check on the Enrolment Rates derived from Monthly Labour Force Survey Data

To check their reliability the enrolment rates derived in the previous chapter were compared with enrolment rate data from other sources. Numerous difficulties were encountered because official enrolment rates for full-time students in regular schools are available by elementary and secondary grades only, not by age groupings, and could be used neither to prove nor to disprove the results obtained from Decision Table No. 1.

However, a special survey carried out by Statistics Canada's Education, Science and Culture Division in 1968²⁶ made possible some comparisons for that year. Available age groups were broken down separately (see Table 9). The official rates for all age groups are slightly lower than the derived enrolment rates. The disparity is due partly to a difference in the reference periods of the two sets of data (September 30, 1968, and late October of the same year) and in part to a difference in coverage of students enrolled. Enrolment rates derived from Decision Table No. 1 are for all full-time students including students enrolled in Department of Manpower and Immigration training courses and those in private trade schools and business colleges; the latter groups are excluded from the data provided by the Education, Science and Culture Division of Statistics Canada.

²⁶ The comparison is made with unpublished data that were used for Table 50 in the publication *Estimated Participation Rates in Canadian Education, 1968-69*, Statistics Canada (Catalogue 81-552, Occasional) (Ottawa: Information Canada, 1972), p. 162.

TABLE 9. Comparison of Enrolment Rates by Age, Fall 1968

Age	Results of decision table no. 1 (late October)	Unpublished figures from the Education Division, Projections Section (for September 30, 1968)	
14 years	98.2	100.6 ¹	97.3 ²
15-16 years	91.7	90.9 ¹	88.0 ²
17-19 "	53.8	48.9 ¹	48.0 ²
20-24 "	13.3	10.6 ¹	10.6 ²

¹ Percentages based on population estimates from the Census Division.

² Percentages based on population estimates corrected by the Education Division, Projections Section, Statistics Canada.

No other comparison can be made for other months or years in view of the absence of statistics on enrolment by age at the national level. Such statistics are available at the provincial level but are unsatisfactory because of the lack of precision in the population estimates serving as denominators when considerable time has elapsed since the last census. Furthermore, estimates of interprovincial migration flows lack precision.

Analysis of Year-to-year Variations

The validity of the derived enrolment rates can also be checked by examining their stability over time. If these enrolment rates are not subject to wide variability over time this would indicate that the results of the validation check with data from the month of April 1971 were not a matter of chance. Enrolment rates from Table 10 are presented in Chart 1.

The rates tend to increase from year to year which can be explained by the fact that enrolment rates have displayed a general upward trend for the past several years. Young people have been attending school in increasing numbers and staying longer.

In the 14-19 age group enrolment rates are much higher (70% to 80%) than in the 20-24 age group (5% to 24%) and the gap between male and female rates shows a tendency to narrow. The drop in enrolment at the university level in 1971-72 is also recorded. It is most strongly marked in the case of men in the 20-24 age group but carries on into the 14-19 age group in 1972-73. A similar decline in female enrolment rates appears in 1972-73 which is also confirmed by official statistics.

Analysis of Month-to-month Variations

Not only do enrolment rates increase from year to year but there is also some variation within individual school years, a phenomenon that appears surprising at first sight. The composition of the sample was first explored to explain this phenomenon. A relative increase in the number of younger persons in the sample from month to month would tend to cause a rise in the enrolment rate since younger members of the 14-24 age group are characterized by higher rates. If this was the case, then the overall enrolment rate would show a month-to-month increase.

In order to determine whether variations in the month-to-month enrolment rate were due to population sampling comparisons were made between the various rotation groups which result in a completely renewed sample by the end of each 6-month period.²⁷ The November-December 1967 and December 1970-January 1971 periods, in particular, came under close scrutiny because of the unusual degrees of discontinuity which they displayed (see Table 11). These comparisons, however, led to a negative conclusion because no rejuvenation of age structure in the successive rotation groups could be discerned.

²⁷ *Canadian Labour Force Survey (Methodology)*, op. cit., p. 26.

TABLE 10. Enrolment Rates by Sex and Age, January-April and October-December, 1966-73

Year and month	Both sexes			Female			Male		
	14-24 years	14-19 years	20-24 years	14-24 years	14-19 years	20-24 years	14-24 years	14-19 years	20-24 years
1966:									
January	48.3	72.1	10.6	44.1	69.4	5.1	52.4	74.8	16.2
February	48.5	72.5	10.6	44.2	69.6	5.0	52.8	75.4	16.3
March	49.0	73.2	10.9	44.7	70.3	5.3	53.3	76.0	16.6
April	48.4	72.6	10.3	44.6	69.8	5.7	52.1	75.2	15.0
October	47.1	70.7	10.5	42.7	67.3	5.5	51.4	74.1	15.6
November	47.6	71.9	10.3	43.2	68.4	5.3	52.0	75.3	15.3
December	47.6	72.0	10.1	43.2	68.4	5.3	51.8	75.5	15.0
1967:									
January	48.0	72.6	10.4	43.6	69.2	5.2	52.3	75.9	15.6
February	48.5	72.9	11.1	44.0	69.8	5.5	52.8	76.0	16.8
March	48.9	73.4	11.5	44.3	70.3	5.5	53.3	76.5	17.4
April	48.8	73.6	11.2	44.5	70.7	5.5	53.0	76.4	16.8
October	47.9	72.1	12.0	43.2	68.8	5.7	52.6	75.3	18.2
November	48.2	72.6	12.2	43.6	69.4	6.0	52.8	75.6	18.3
December	48.8	73.3	12.5	43.9	69.7	6.4	53.5	76.8	18.6
1968:									
January	49.1	73.6	13.1	44.1	70.0	6.5	54.0	77.0	19.6
February	49.8	74.0	14.4	45.3	71.2	7.8	54.3	76.6	20.9
March	49.6	74.0	13.9	45.2	71.2	7.6	54.0	76.7	20.2
April	49.8	74.6	13.4	45.8	72.8	7.1	53.6	76.4	19.7
October	49.3	74.5	13.3	45.1	71.9	7.2	53.5	76.9	19.3
November	49.9	75.0	14.0	45.8	72.7	7.8	53.9	77.2	20.2
December	50.0	75.3	13.8	45.9	72.8	8.0	54.0	77.8	19.6
1969:									
January	50.0	75.7	13.5	46.1	73.4	7.9	53.8	77.9	19.1
February	50.5	76.1	14.1	46.5	73.8	8.4	54.3	78.2	19.8
March	49.4	74.6	13.7	46.0	73.0	8.3	52.8	76.2	19.0
April	50.2	75.7	14.0	46.6	73.9	8.7	53.6	77.5	19.3
October	49.8	75.2	14.5	45.2	71.9	8.4	54.4	78.3	20.5
November	50.7	76.2	15.2	46.2	73.5	8.9	55.1	78.9	21.5
December	51.0	76.8	15.1	47.0	74.7	9.2	54.8	78.8	20.9
1970:									
January	50.9	76.7	15.1	46.8	74.8	8.6	54.8	78.6	21.4
February	51.4	77.2	15.8	47.1	75.2	8.9	55.6	79.1	22.5
March	51.7	77.3	16.3	47.6	75.8	9.3	55.7	78.8	23.2
April	51.3	77.5	15.3	47.3	76.0	8.4	55.2	78.8	22.1
October	49.8	75.3	15.0	45.4	72.8	8.6	54.0	77.7	21.3
November	50.1	75.8	15.0	45.9	73.8	8.5	54.1	77.7	21.4
December	50.6	76.4	15.4	46.1	74.0	8.7	54.9	78.7	22.0
1971:									
January	50.9	76.5	16.1	46.5	73.8	9.8	55.2	79.1	22.2
February	50.9	76.4	16.3	46.7	74.1	10.0	55.0	78.7	22.5
March	51.6	77.1	16.9	47.4	74.6	10.9	55.6	79.6	22.7
April	51.3	76.7	16.8	47.6	74.9	11.0	54.9	78.5	22.4
October	49.3	75.3	14.3	45.8	73.5	9.0	52.7	77.0	19.5
November	50.0	76.1	14.9	46.6	74.2	9.8	53.4	77.9	19.9
December	50.5	76.7	15.3	47.2	74.6	10.9	53.7	78.7	19.6
1972:									
January	50.1	76.1	15.2	47.1	74.4	10.8	53.1	77.7	19.5
February	50.8	77.1	15.5	47.8	75.6	10.8	53.8	78.6	20.1
March	50.6	76.6	15.7	48.1	75.8	11.3	53.0	77.3	20.0
April	50.2	76.3	15.2	47.5	75.4	10.4	52.8	77.1	19.8
October	48.9	73.9	15.5	45.9	72.8	10.5	51.8	75.1	20.4
November	49.4	74.7	15.6	46.4	73.5	10.5	52.3	75.9	20.5
December	49.4	74.7	15.7	46.5	73.6	10.6	52.3	75.7	20.6
1973:									
January	49.6	74.7	15.9	46.6	73.6	10.8	52.4	75.7	20.9
February	49.8	75.2	15.9	46.7	74.2	10.4	52.8	76.1	21.2
March	49.0	73.7	15.9	46.3	72.7	11.5	51.5	74.7	20.1
April	49.2	74.8	14.9	46.8	74.2	10.7	51.4	75.3	19.1

Chart-1

Enrolment Rate by Age Group, Males and Females,
January-April and October-December, 1966-73

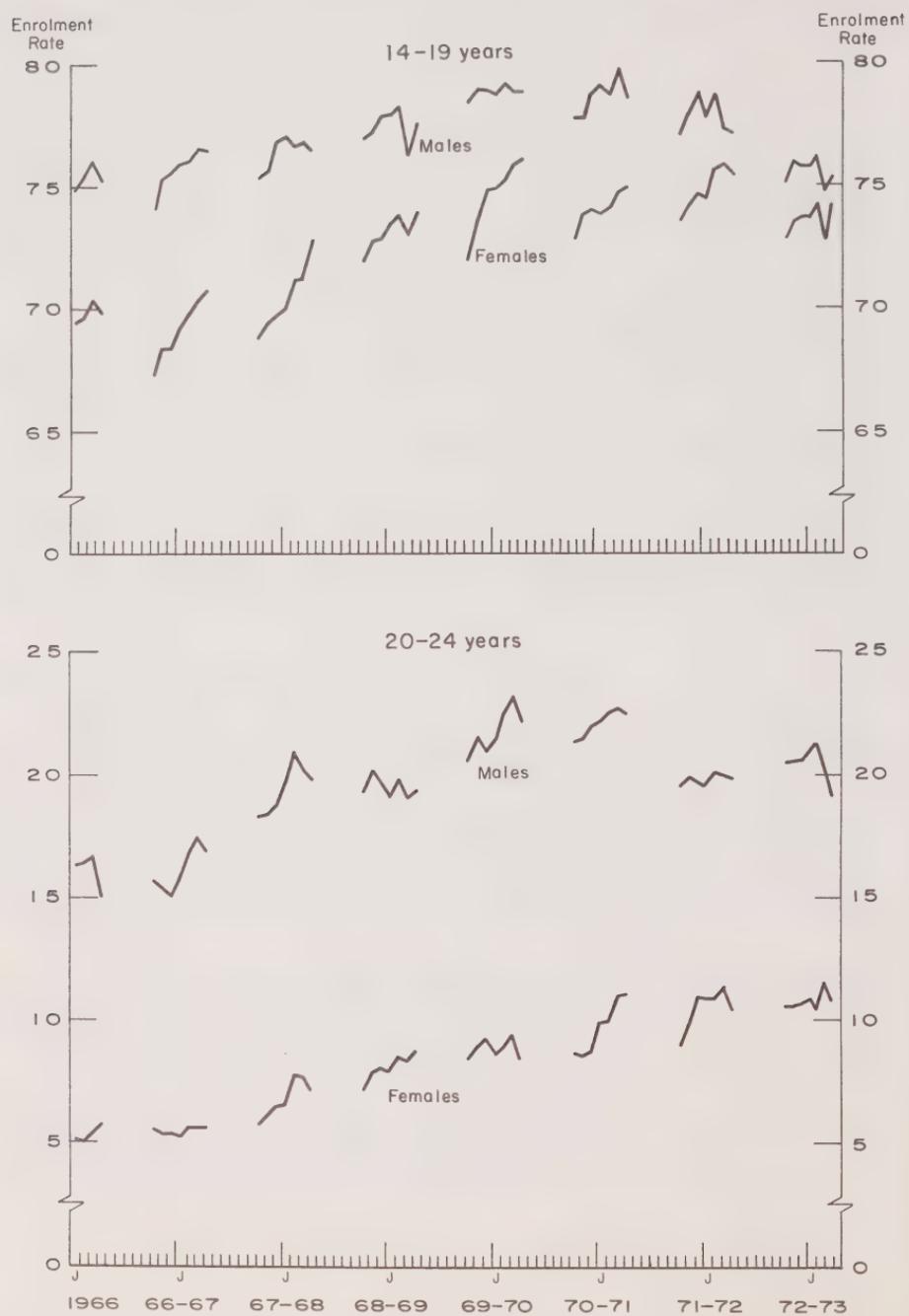


TABLE 11. Distribution of Rotating Groups by Student/Non-student Status and Age, November and December 1967, December 1970 and January 1971

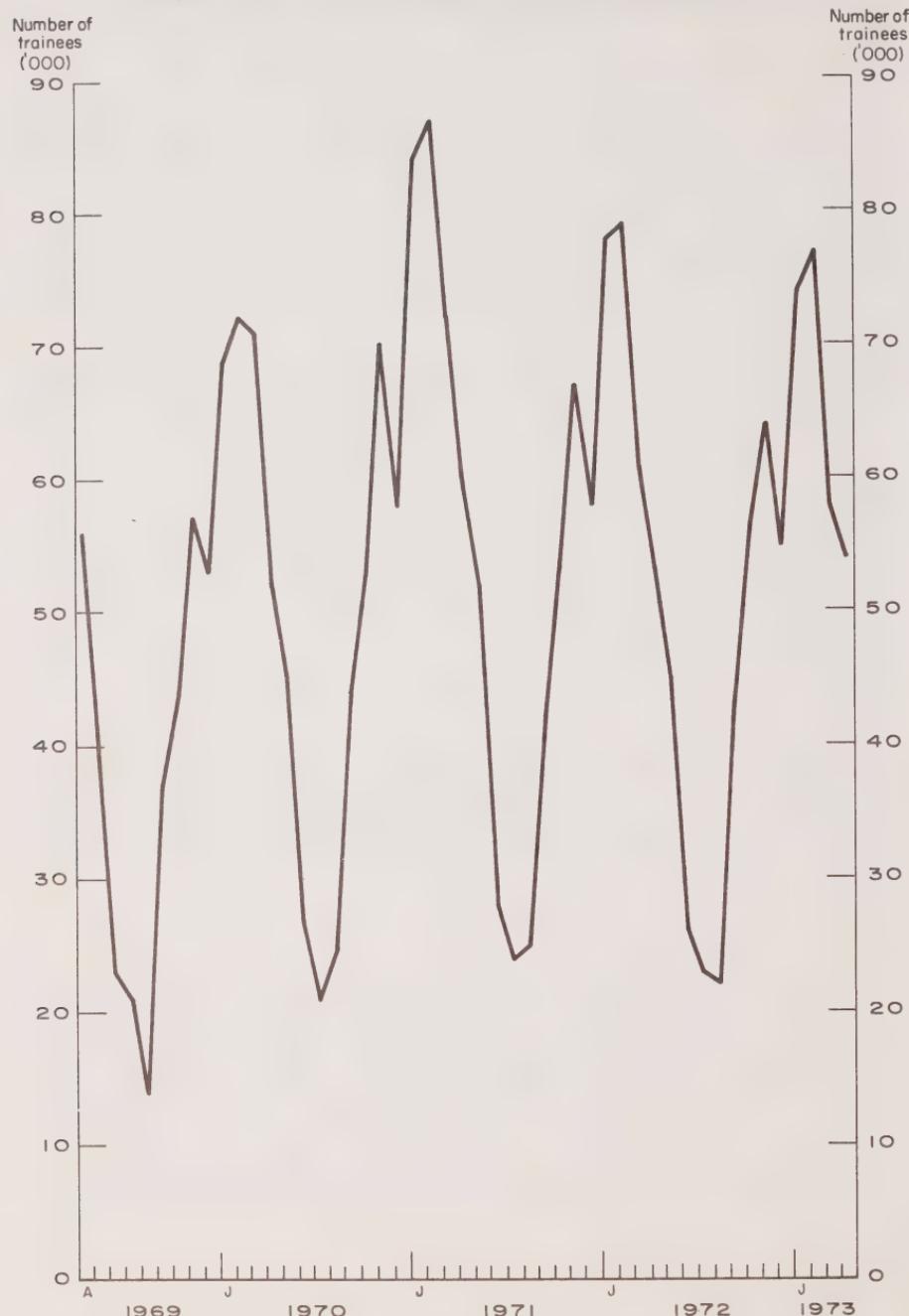
Age and status	Rotating group			
	Leaving Nov. 1967	Entering Dec. 1967	Leaving Dec. 1970	Entering Jan. 1971
percentage				
14 years:				
Students	11.25	10.31	10.25	10.20
Non-students . . . . .	.24	.17	.18	.05
Total	11.49	10.48	10.43	10.25
15-16 years:				
Students	18.43	20.40	20.32	19.91
Non-students	2.61	1.76	2.23	1.27
Total	21.04	22.16	22.55	21.18
17-19 years:				
Students	13.67	15.89	13.72	16.87
Non-students	15.77	14.23	12.72	11.30
Total	29.44	30.12	26.44	28.17
20-24 years:				
Students	4.25	5.07	5.37	6.99
Non-students	33.77	32.17	35.21	33.40
Total	38.02	37.24	40.58	40.39
14-24 years:				
Students	47.60	51.67	49.65	53.97
Non-students	52.40	48.33	50.35	46.03
Total	100.00	100.00	100.00	100.00

The second hypothesis explored to account for the month-to-month increases in enrolment rates concerned the impact of special programs organized by the Department of Manpower and Immigration. For those years for which month-to-month data are available²⁸ (1969-73), comparisons can be made between variations in the number of participants in manpower training programs and variations in the derived rates (see Chart 2). As can be seen, there is some degree of correspondence between month-to-month changes in enrolment rates and variations in the number of persons participating in manpower training programs.

²⁸ Unpublished data, Department of Manpower and Immigration.

Chart-2

Full-time Trainees in Training Programs,
Department of Manpower and Immigration, 1969-73



Source: Annual Report, Department of Manpower and Immigration.

There are very few statistics available on training programs but a breakdown of trainees by age and sex was available (see Table 12). In view of the fact that over 70% of the trainees are male and since the 20-24 age group always accounts for over 32% of the total, it was possible to trace the influence of these programs on enrolment rates for men in the 20-24 age group.

TABLE 12. Age-sex Distribution of Full-time Trainees, Manpower Training Programs,
Department of Manpower and Immigration, 1967-73

Sex and age	Canada, 1967-73					
	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73
Sex:						
Male	80.6	80.9	78.9	78.3	74.4	70.5
Female	19.4	19.1	21.1	21.7	25.6	29.5
Age: ¹						
Under 19 years	5.3	8.5	7.6	6.0	9.2	2
20-24 years	33.4	34.7	34.6	33.6	32.0	2
25-44 years	43.7	46.7	47.2	48.4	47.3	2
Over 45 years	8.4	9.3	10.6	12.0	11.5	2

¹ Percentages do not always add up to 100 because some trainees neglected to indicate their ages.

² Not available.

Source: Unpublished data, Department of Manpower and Immigration.

The curves showing enrolment rates for men in the 20-24 age group on the one hand, and the numbers taking training courses between 1969 and 1973 on the other reveal, in each case, a rise in November followed by a drop in December, then a recovery in January and February. There is thus a considerable degree of correspondence from October to February. During March and April the number of men taking training courses falls rapidly while school enrolment rates remain much more stable. This may be explained by the respective reference periods for the two data series: the reference week for the Labour Force Survey from which enrolment rates are derived is the second week of every month whereas the number of persons taking training courses is determined by a "census" at the end of the month. The two sets of data are thus collected a fortnight apart and this may explain the fact that the drop in the enrolment rate in April is a month behind the drop in the number of persons participating in manpower training programs.

The total male population in the 20-24 age group is approximately one million of which about 200,000 are students. By applying the percentages from Table 12 to the data given in Chart 2 it becomes evident that the number of men between the ages of 20 and 24 who participate in manpower training programs varies from 13,000 to 23,000, depending on the time of year. Since these figures

represent from 6% to 12% of the total number of male students in the 20-24 age group, the training programs have a definite effect on enrolment rates in this group. A change of 10% in the number of students in this group means a change of just over 2% in the corresponding enrolment rate. Month-to-month changes in the derived enrolment rates are, in fact, of this order of magnitude.

One can surmise that a similar phenomenon occurs in the other groups, though on a smaller scale (a feature which makes the effort more difficult to observe in the case of these groups). Women account for, at most, 30% of the number of persons taking training courses and 7.0% of the trainees are from the 19-and-under age group. To summarize, the month-to-month fluctuation in enrolment rates is to a considerable extent the result of the impact made by the special courses organized by the Department of Manpower and Immigration.

On the other hand, the largest month-to-month variations occur among women in the 14-19 age group, a phenomenon that remains unexplained. For this group a possible explanation is enrolment in private schools, especially business colleges, which have widely divergent calendars and are commonly attended by members of this population group. Unfortunately, this hypothesis cannot be tested in the absence of adequate data.

Analysis of Cyclical Fluctuations

The graph showing enrolment rates indicates an upward trend for all groups. This trend, however, is not strictly linear in nature. Faced with a deteriorating labour market situation young people may decide to stay in school longer or even go back to school. This pattern was observed in the United States during the postwar years by Beverly Duncan:

“Inspection of the fluctuations in unemployment levels and continuation percentages suggests that rises in unemployment are generally accompanied by atypically large increases in continuation”.²⁹

Bowen and Finegan’s study³⁰ provides additional support on this point, although statistical evidence can be found only in cross-section data since a statistical test of the relationship using time series data is not significant. Jacob Mincer also alludes to this phenomenon when he states:

“The data indicate not only labour force withdrawals in recession periods but also relative increases in school enrolment at such times, an interesting reflection of changing opportunity costs during the business cycle”.³¹

²⁹ Beverly Duncan, *op. cit.*, p. 128.

³⁰ William G. Bowen and T. Aldrich Finegan, *op. cit.*, p. 468.

³¹ Jacob Mincer, *op. cit.*, p. 98.

In view of the possibility that the enrolment rate might be a function of the unemployment rate, a correlation was calculated for fluctuations in the unemployment rate and year-to-year changes in enrolment rates to see whether Canadian data pointed in the same direction as American data. To minimize the effect of the Department of Manpower's training programs, use was made only of data from the month of October. With only 7 pairs of observations available, however, no statistically significant results could be obtained from this correlation.

In the next chapters participation rates will be analyzed and the relationships between those rates and seasonal and cyclical demand for labour will be studied.

CHAPTER IV

PARTICIPATION RATES

As one would expect, an examination of labour force participation rates by student and non-student status reveals marked differences in level of participation. Not only are the levels different but the statistics also show variation in trends.

Levels of Participation

As can be seen from Table 13 (or Charts 3 and 4) the school enrolment factor has a substantial impact. For each age-sex group comparison students have a labour force participation rate that is substantially lower than the non-student rate.

Student participation rates vary between 6.9% and 22.5%. The divergences among the various groups are relatively small and no one group assumes the lead for the whole period. The younger females have the lowest participation rates throughout the period.

Almost all males in the 20-24 age group who have left school are members of the labour force. Their level of labour force participation (96.5% to 98.8%) parallels the level for prime-age males.³²

Teenage males who are out of school also have a higher level of participation. Between 1966 and 1973 90.1% to 94.7% of them were in the labour force.

In comparison with their male counterparts, females in the 14-19 and 20-24 age categories who are out of school have substantially lower labour force participation levels. The participation rates of the former group range between 69.4% and 76.2% while participation rates of the older group vary between 56.5% and 65.3%. The lower participation level among older women is related to the fact that this group includes a larger number of married women with young children.³³

³² During the same months between 96.0% and 97.8% of males in the 25-44 age group were attached to the labour force. *Seasonally Adjusted Labour Force Statistics, January 1953-December 1971*, Statistics Canada (Catalogue 71-201, Annual) (Ottawa: Information Canada, 1972), p. 201.

³³ The low participation level among married women has been the subject of several Canadian studies: Sylvia Ostry, "The Female Worker in Canada", *1961 Census Monograph Programme*, Statistics Canada (Ottawa: Information Canada, 1968), p. 16; B.G. Spencer and D.C. Featherstone, "Married Female Labour Force Participation: A Micro Study", *Special Labour Force Studies, Series B, No. 4*, Statistics Canada (Catalogue 71-516, Occasional) (Ottawa: Information Canada, 1971); J.D. Allingham, "Women Who Work: Part 1", *Special Labour Force Studies, No. 5*, Statistics Canada (Catalogue 71-509, Occasional) (Ottawa: Information Canada, 1967); and J.D. Allingham and B.G. Spencer, "Women Who Work: Part 2", *Special Labour Force Studies, Series B, No. 2*, Statistics Canada (Catalogue 71-514, Occasional) (Ottawa: Information Canada, 1968).

TABLE 13. Participation Rates by Age Group, Students and Non-students, Males and Females, January-April and October-December, 1966-73¹

Year and month	Students				Non-students			
	14-19 years		20-24 years		14-19 years		20-24 years	
	Male	Female	Male	Female	Male	Female	Male	Female
1966:								
January	12.2	7.8	12.1	9.5	92.8	72.0	97.2	56.5
February	12.9	7.4	12.7	9.7	94.0	72.6	97.8	56.5
March	13.6	7.8	11.8	10.9	93.8	73.7	97.9	58.0
April	14.2	8.9	11.2	8.5	93.0	74.6	98.0	58.3
October	15.3	9.4	12.5	9.1	94.0	76.2	98.8	59.3
November	13.9	8.9	11.3	10.1	94.4	74.0	98.3	58.1
December	14.3	8.5	10.5	7.9	93.5	72.3	98.0	58.6
1967:								
January	13.9	6.9	11.7	8.1	92.7	71.0	97.8	58.6
February	13.3	6.9	10.7	7.1	92.5	71.0	97.5	58.6
March	16.3	9.4	14.1	11.1	94.2	74.0	97.4	59.6
April	15.8	9.4	12.5	12.0	94.2	72.6	97.2	58.9
October	15.0	9.8	10.5	9.2	94.2	75.0	98.1	59.0
November	15.4	11.0	11.2	12.3	94.7	74.4	97.8	59.4
December	16.3	12.1	9.9	9.5	93.5	74.5	97.7	60.5
1968:								
January	14.8	9.9	10.5	10.8	91.1	72.5	96.9	60.2
February	14.9	10.9	10.8	12.0	93.1	71.9	97.0	61.2
March	13.8	9.9	10.8	10.5	93.2	71.9	97.1	61.5
April	16.3	10.7	10.6	8.4	94.2	74.7	97.8	61.5
October	17.8	12.3	16.9	13.0	93.6	74.9	98.1	61.8
November	18.4	14.0	17.1	15.9	93.5	74.3	97.6	61.2
December	16.8	13.1	15.0	16.2	93.9	75.3	97.4	60.4
1969:								
January	16.1	10.6	13.7	12.4	92.7	73.3	96.9	61.2
February	15.2	10.8	15.6	12.5	93.0	73.1	97.4	62.6
March	14.2	10.5	13.9	12.0	92.1	73.8	96.9	63.0
April	18.1	13.0	12.9	13.3	91.4	72.5	97.4	64.2
October	17.3	12.9	14.0	15.3	92.0	72.8	97.6	63.0
November	17.3	13.1	16.1	14.8	92.8	74.6	96.9	62.2
December	17.6	13.1	14.0	15.6	92.3	72.3	97.0	61.4
1970:								
January	15.3	10.8	11.4	12.1	90.7	70.5	97.2	60.9
February	16.3	11.2	13.7	12.1	92.8	71.2	97.2	61.3
March	16.8	11.9	15.5	14.3	93.0	70.7	97.0	61.7
April	19.0	13.0	15.5	14.9	91.9	70.6	97.4	61.0
October	18.9	13.5	17.5	18.9	92.4	74.3	97.1	61.5
November	19.3	13.1	17.6	15.8	91.7	72.8	97.2	61.9
December	18.5	13.1	15.4	16.6	90.4	72.2	97.2	62.3
1971:								
January	18.3	12.5	15.5	14.2	90.1	71.6	96.8	62.9
February	17.9	13.1	14.6	16.9	91.0	71.0	96.7	62.8
March	17.5	12.1	15.7	13.2	92.0	69.5	97.0	62.6
April	19.0	13.5	15.9	14.5	91.6	69.4	97.1	62.7
October	18.5	13.8	15.8	18.1	92.7	75.2	97.4	65.3
November	18.2	13.2	16.6	22.5	93.8	74.8	97.5	64.8
December	18.4	15.2	17.8	19.5	92.2	73.7	97.2	65.0
1972:								
January	17.0	13.4	16.5	18.9	91.6	70.7	97.1	63.7
February	16.7	13.0	17.7	20.2	93.1	71.6	96.5	63.3
March	18.8	13.8	18.5	22.5	92.4	70.1	96.5	64.2
April	19.8	14.3	16.9	16.3	92.7	70.5	96.7	62.6
October	18.8	14.3	19.5	18.2	92.1	73.7	96.5	65.2
November	17.5	14.3	18.8	15.8	93.8	73.8	97.1	66.0
December	19.3	16.3	20.5	18.1	93.1	73.3	96.2	65.0
1973:								
January	19.1	15.1	19.6	15.9	91.6	70.1	96.4	65.1
February	18.4	14.7	18.3	16.2	92.7	71.3	97.0	66.6
March	18.2	13.2	15.2	16.5	93.7	73.3	97.1	65.7
April	22.2	15.4	17.7	14.6	93.4	72.5	97.0	65.5

¹ These estimates are derived through Decision Table No. 1 and, therefore, could differ from estimates derived through direct measurement.

Chart-3

Non-Student Participation Rate, Two Age Groups, Males and Females, 1966-73

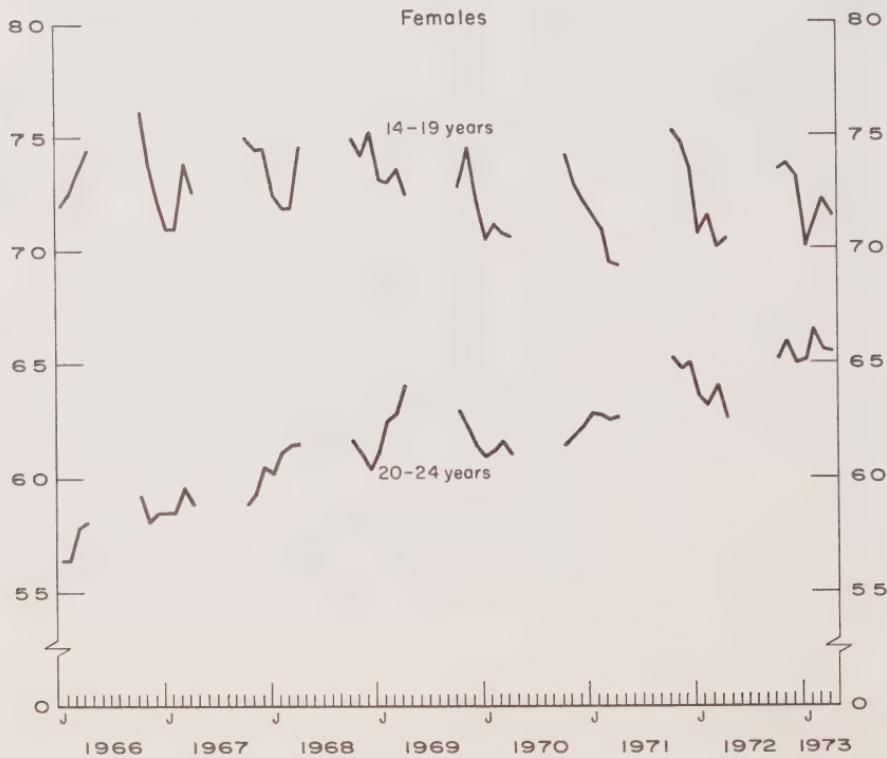
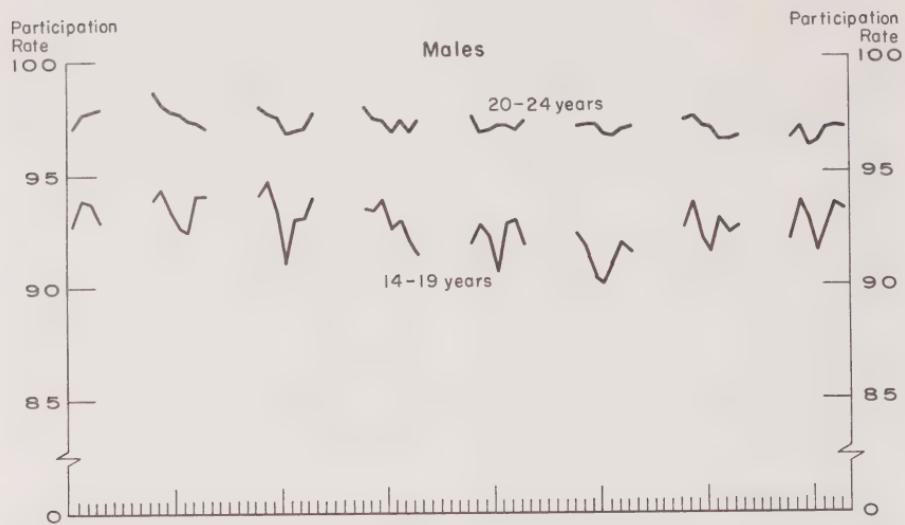
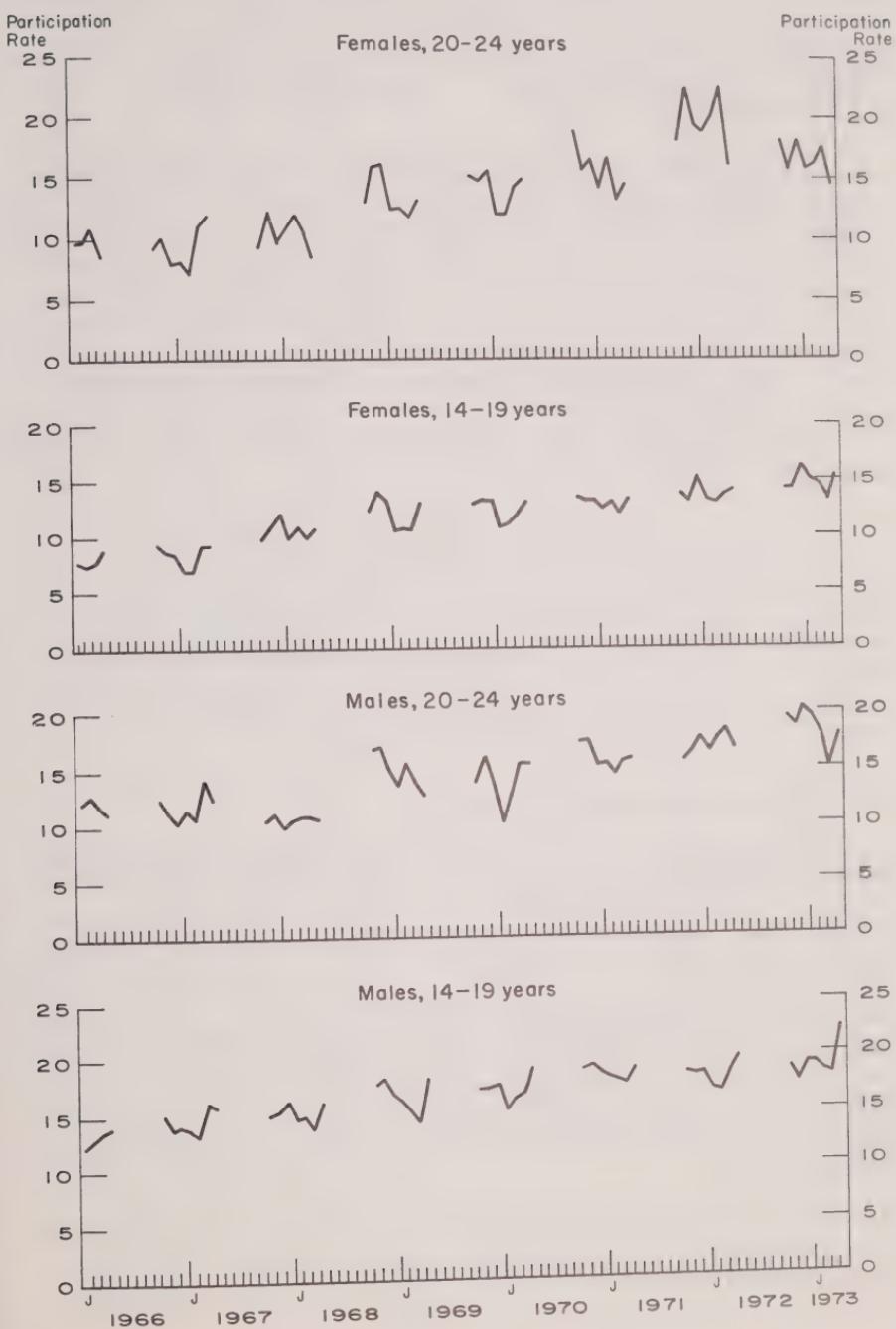


Chart-4

Student Participation Rate, Two Age Groups,
Males and Females, 1966-73



Trends in Participation Rates

Trends in participation among the two groups are strikingly dissimilar (year-to-year changes are graphed in Charts 5 and 6) which is persuasive evidence of the importance of studying the student and non-student groups separately. Three of the four non-student groups moved slowly downward, but the four student groups, however, moved steeply upward. In Chart 7, where year-to-year changes for the combined student and non-student population are recorded, trends are less strongly defined.

Participation rates for non-students tend to decline (see Chart 5). Women in the 20-24 age group constitute an exception to this general tendency with clearly perceptible upward trends among both the student and non-student components. Participation rates for female non-students in the 14-19 age group remained nearly stable with only the slightest downward trend. Rates for male non-students in the 20-24 age group reveal a tendency to decline which parallels a similar tendency in participation rates among male workers in the 25-44 age group. The changes are relatively slight in terms of actual magnitude but there is an unmistakable and persistent downward movement. Rates for male non-students in the 14-19 age group decline from year to year. The past two academic years have been exceptional in terms of the overall trend.

Year-to-year changes in participation rates for students in the 20-24 age group are much more strongly marked than for the younger in-school groups. The most striking trend, an upward one, is visible among the female in-school 20-24 age group. For male students in the same age group participation rates tend, by and large, to rise, although with some fairly considerable exceptions during the first years of the period. Moderate upward trends, of roughly the same order of magnitude, are apparent for students in both 14-19 age groups and, with a few exceptions, this trend continues throughout the period.

Seasonal Movements in Participation Rates

The derived labour force participation series were not seasonally adjusted because only incomplete years are covered (the months of the academic year are the only ones used for analysis). The need for observations extending over a period of several years is demonstrated in Table 14 which gives cumulative month-to-month results including increases (+), declines (-) and months in which no change occurred (0). In a number of cases it was not possible to establish the normal change in participation rates with any certainty because increases and declines balance out, or nearly so. The month of January is the only one in which there is a general drop in participation for the 14-24 age group as a whole. In addition, month-to-month changes in student participation rates suggest that a different seasonal model may be indicated for the 14-19 age group than for the 20-24 age group.

Chart-5

Annual Change in Non-Student Participation Rate,
Two Age Groups, Males and Females, 1966-73

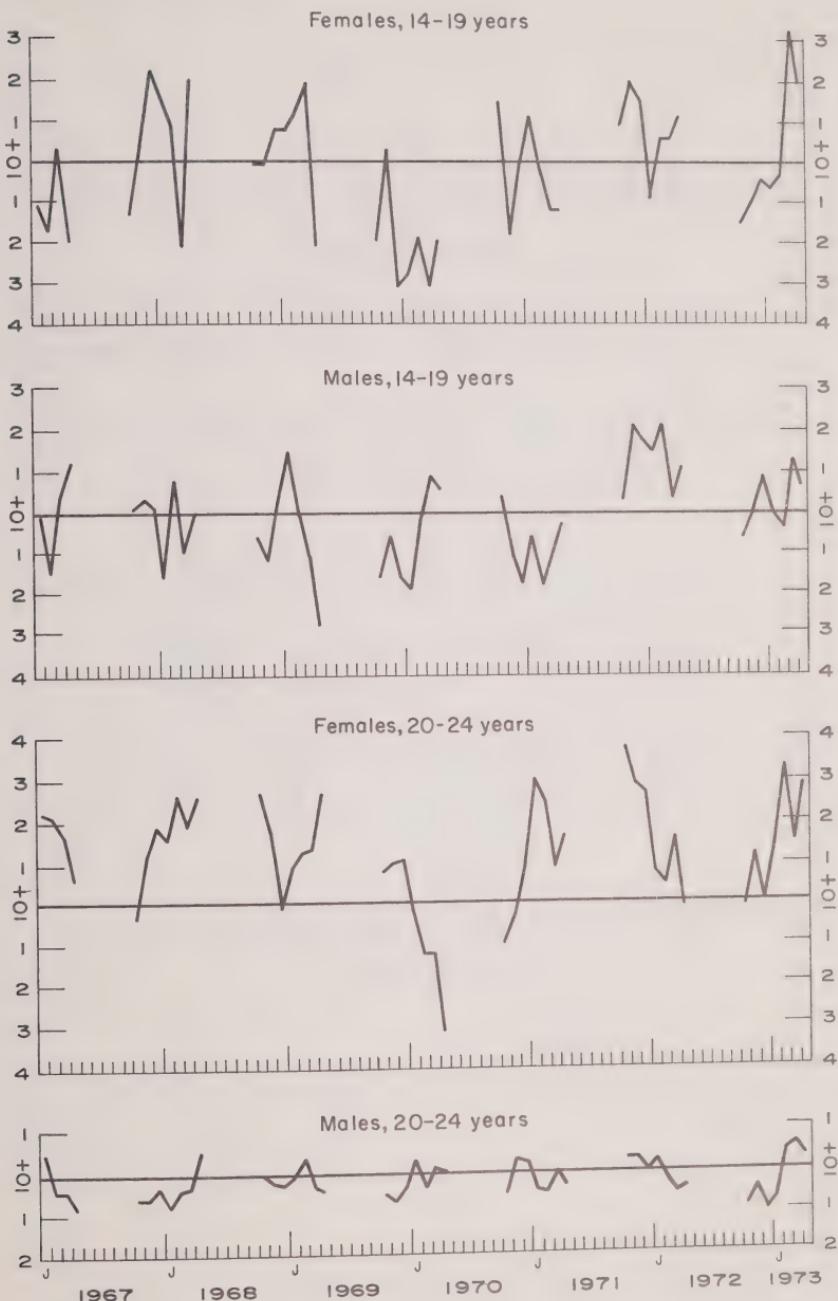


Chart-6

Annual Change in Student Participation Rate,
Two Age Groups, Males and Females, 1966-73

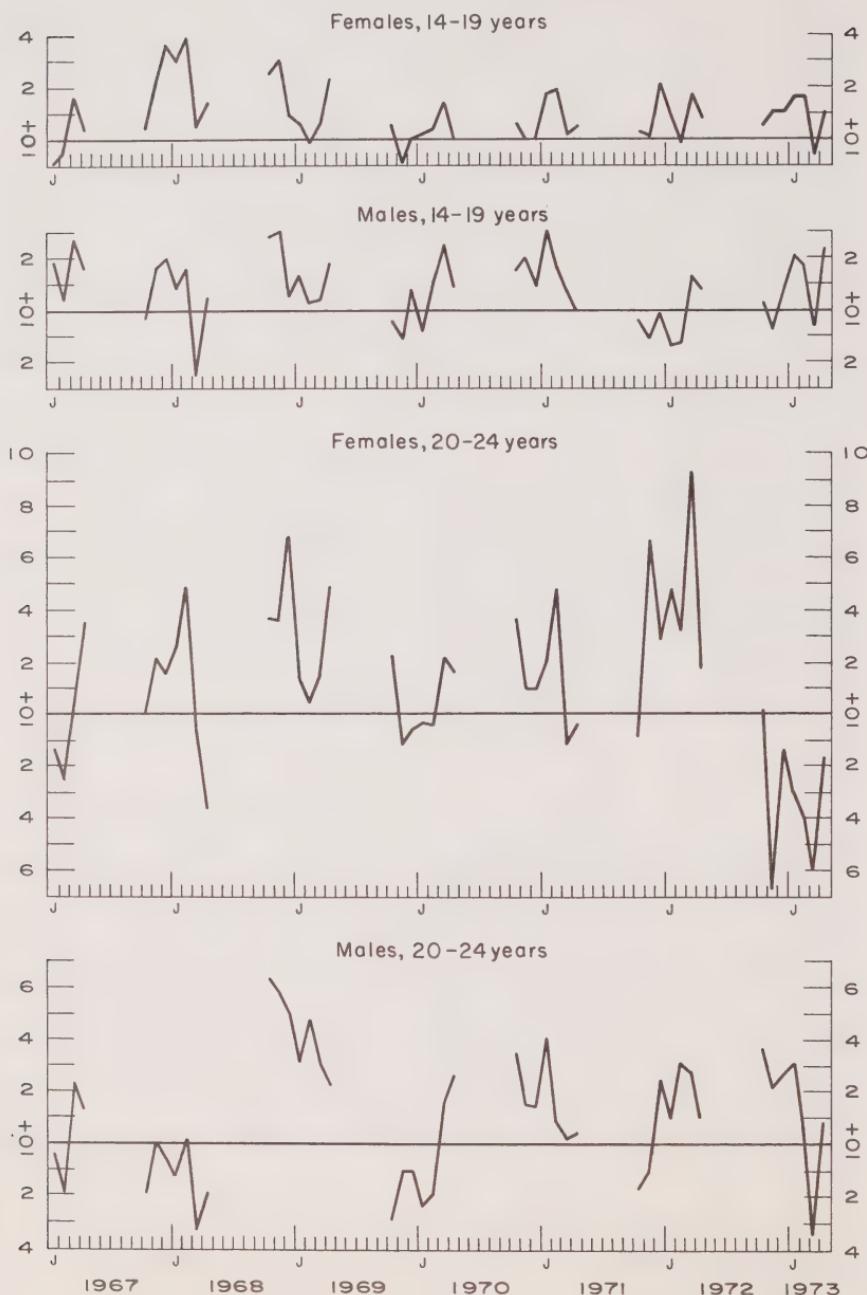


Chart-7

Annual Change in Student and Non-Student
Participation Rate, Two Age Groups, Males and
Females, 1966-73

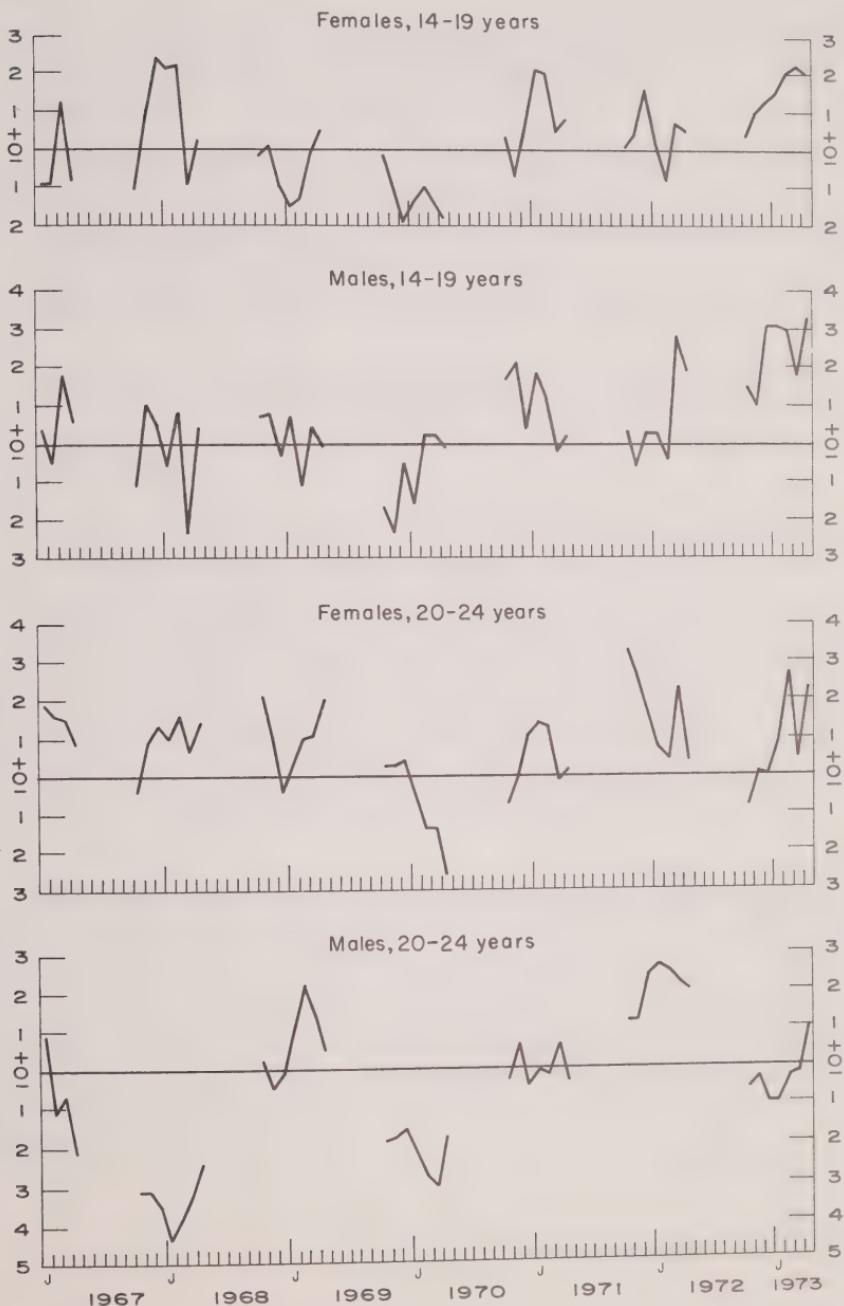


TABLE 14. Summary of Month-to-month Changes in Participation Rates, 1966-73

Status, sex and age	January			February			March			April			November			December		
	+	-	0	+	-	0	+	-	0	+	-	0	+	-	0	+	-	0
Students:																		
Male:																		
20-24 years	3	4	—	5	3	—	5	3	—	3	5	—	5	2	—	2	5	—
14-19 "	—	7	—	3	5	—	4	4	—	7	1	—	3	3	—	1	5	—
Female:																		
20-24 years	2	5	—	6	1	1	5	3	—	4	4	—	4	3	—	4	3	—
14-19 "	—	7	—	4	1	—	4	4	—	7	1	—	3	3	—	1	4	—
Non-students:																		
Male:																		
20-24 years	2	5	—	4	4	—	4	4	—	6	2	—	3	4	—	1	6	—
14-19 "	—	7	—	7	1	—	5	3	—	3	5	—	5	2	—	1	6	—
Female:																		
20-24 years	3	4	—	6	2	—	6	2	—	3	5	—	3	4	—	4	3	—
14-19 "	1	6	—	3	5	—	3	5	—	4	4	—	2	5	—	2	5	—

CHAPTER V

RESULTS OF THE ANALYSIS

To measure the impact of seasonal and cyclical shortfalls in demand on participation rates, the following model was developed in Chapter I:

$$PR_{ij} = a_0 + a_1 SF_i + a_2 CU_{-2} + a_3 CU_{-6} + a_4 CU_{-12} + e$$

where:

PR_{ij} is the participation rate of age-sex group i , i extending from 1 . . . to 4, and with student/non-student status j , j being equal to 1, 2;

a_0 is a constant;

SF_i is the seasonal unemployment factor for the age-sex group i ;

CU_{-2} , CU_{-6} , and CU_{-12} are cyclical unemployment rates for males in the 25-44 age group with lags of 2, 6, and 12 months respectively, e.g., CU_{-12} is the unemployment rate 12 months earlier;

.e is an error term.

Participation rates (PR_{ij}) as calculated on the basis of data obtained through Decision Table No. 1 are given in Table 13. This permits eight regressions in all: males and females; two age groups, 14-19 and 20-24; and student status and non-student status.

The seasonal demand deficit is represented by the seasonal unemployment factor for each of the age-sex groups under review. Since the analysis applies only to the months of the school year, it is not possible to employ seasonal in-school and out-of-school unemployment factors. This lack of precision in the seasonal demand variable will be minimal for students in the 14-19 age group and for non-students in the 20-24 age group in view of the fact that students predominate in the first of these groups and non-students predominate in the second. The seasonal factors are those used to calculate official Canadian unemployment rates. They are derived from the X-11 Variant of the American Bureau of the Census Seasonal Adjustment Method No. II and are given in Appendix C.

The cyclical unemployment rate for males in the 25-44 age group, without the irregular movement, represents the deficit in cyclical demand. To remove the irregular movement centred moving averages were calculated for numbers of both employed and unemployed. A 3-month period was used to calculate the moving average for unemployment while a 2-month period was used in the case of employment. A special point was made of retaining the official method of adding seasonally adjusted employment and unemployment figures together when calculating the denominator of the unemployment rate. The figures used will be found in Appendix D.

The results of the regressions are given in Table 15.³⁴ The seasonal factor is negative in all cases for which it is significant. It is not significant in the case of out-of-school females in the 20-24 age group. Also, the influence of the seasonal demand variable is stronger for females than for males. It varies between -.05 and -.07 for females while for males it ranges between -.01 and -.03. This means that, all other factors held constant, an increase of 10 in the seasonal factor results in a decline of from 0.1 to 0.7 in the participation rate.

Coefficients of variables represent the effect for the whole of the period under review (1966-73). During this period maximum variation in seasonal factors for one year occurred in the case of women in the 14-19 age group (see Appendix C).³⁵ Given the coefficients the seasonal factor resulted in an annual mean variation of -5.01 in participation rates for this group over the total period. Seasonal demand had a comparable effect on participation rates for female

³⁴ For the female in-school 20-24 age group it was necessary to force the constant into the regression to obtain a model comparable to the one used for the other groups under review. When the constant is not included, the following results are obtained:

$$PR = -0.03SF + 1.61CU_{-2} + 2.50CU_{-12};$$

$$\bar{R}^2 = .74; s = 1.91; D.W. = 1.62; F = 51.12.$$

³⁵ The range of annual variation averages out at 62.6 for males in the 14-19 age group, 71.5 for females in the 14-19 age group and 65.5 for males in the 20-24 age group. For females in the 20-24 age group, however, it is only 30.3.

TABLE 15. Regression Results¹ for Students and Non-students by Age and Sex, 1966-73

Variables:	Students				Non-students			
	14-19 years		20-24 years		14-19 years		20-24 years	
	Male	Female	Male	Female	Male	Female	Male	Female
Constant	12.60	7.88	4.69	2.84 ²	97.31	80.18	100.12	50.43
Seasonal factor	-.03	-.07	-.02 ³	-.05 ⁴	-.02 ⁵	-.06 ⁴	-.01	...
Cyclical unemployment rates:								
With 2-month lag . . . . .	...	1.54	1.06	1.53	-.63	...	-.42	1.25
With 6-month lag	1.78	...	...	...	...	-.45 ⁴	...	...
With 12-month lag . . . . .	...	.98	1.91	2.42	...	...	...	1.50
Statistical measures:								
s	1.16	1.17	1.54	1.91	.91	1.59	.33	1.22
\bar{R}^2 . . . . .	.70	.76	.71	.74	.29	.10	.60	.77
D.W.	1.47	1.08	1.21	1.66	1.16	1.22	1.25	.58
F of the regression	60.46	54.44	43.83	51.08	11.71	3.94	39.77	85.66

¹ These regressions have been calculated using only variables with "F" having a value of 3.0 or more i.e., significant at the .10 level. All coefficients, however, are significant at the .01 level except as indicated in the footnotes.

² See footnote 34 above.

³ Significant at the .05 level.

⁴ Significant at the .10 level.

⁵ Significant at the .02 level.

non-students in the same age group (-4.29). The impact on male non-students in the 20-24 age group was minimal (-.66) and ranged between -1.25 and -1.88 in other cases. In the case of female non-students 20-24 years of age the seasonal demand factor had no influence.

With respect to the cyclical demand variables, lags of 2, 6 and 12 months were chosen to test for the existence of an immediate reaction, a somewhat more delayed reaction and finally a reaction appearing after the lapse of a full year.

The effect of cyclical unemployment is positive for all student groups and negative for all non-students except women in the 20-24 age group. For this group the coefficients are positive, a point that is elaborated later in the section. The economic activity level has a two-fold impact on student participation rates (except in one instance): an immediate reaction within 2 months of the rise in the unemployment rate and a second reaction a year later. In the case of non-students, not only is the reaction negative instead of positive, it is also much weaker. Since the observations in the model have been expressed as percentages, the partial regression coefficients associated with the cyclical unemployment rate variable shows the effect on the participation rate of a one unit increase in this rate. For example, other factors held constant, an increase of 1% in the cyclical unemployment rate results, six months later, in an increase of 1.78 in the participation rate for male students in the 14-19 age group.

The influence of the cyclical unemployment rate for all student groups is considerable. With only one exception, a one percentage point increase in the cyclical unemployment rate gives rise to a greater than one percentage point increase in the participation rate. The strongest reaction, in absolute terms, to a shortfall in cyclical demand occurs in the case of female students in the 20-24 age group. Males in this category come next, followed by female and male students 14-19 years of age respectively.

The reaction in the case of non-students is not as great although still marked. The maximum effect of a rise of 1% in the cyclical unemployment rate is -.63; this is the rate observed for males in the 14-19 age group. The reaction makes its appearance among non-students 2 months later or 6 months later, depending on the group observed.

Female non-students in the 20-24 age group constitute an exception to the norm. It may be that the model, as specified, is not applicable to this group. The Durbin - Watson statistic for this group does in fact suggest an incorrectly specified relationship, the omission of one or more explanatory variables, or an error in observation estimates.³⁶ In the case at hand one of the first two explanations would seem to be more reasonable. Participation in the labour force by women in the 20-24 age group is characterized by a strong upward trend

³⁶ J. Johnston, *op. cit.*, pp. 177-78.

accompanied by downward rigidity. Since the 1960's any decline in the unemployment rate has been associated with a sharp upswing in participation rates for this group. A rise in the unemployment rate moderates this upward trend but does not actually reverse it. Only with the onset of sustained unemployment rates in the 1970's has some vacillation occurred in participation rates for this group.

The model also proved to be weak in explaining the behaviour of the non-students, both males and females, in the 14-19 age group. For these groups no more than 29% and 10% respectively of the fluctuations occurring in participation rates can be attributed to the variables used in the model. The model does, however, appear to be eminently applicable to the other groups, notably the in-school groups.

CHAPTER VI

CONCLUSIONS

To measure the effect of seasonal and cyclical demand on the labour force participation of young students and non-students has been the primary purpose of this study. As noted in Chapter I both seasonal and cyclical demand may result in either an "additional worker" effect or a "discouraged worker" effect and these effects are independent of one another. While the effects of these influences appear similar, these two types of variation in demand may affect a particular group simultaneously with opposite results, that is, one with a "discouraged worker" and the other with an "additional worker" effect.

For those cases where the effect of seasonal demand is significant the results point to a "discouraged worker" effect. Cyclical demand, on the other hand, produces an "additional worker" effect among students but a "discouraged worker" effect among non-students. The hypothesis that the two types of demand may cause opposite results simultaneously is thus borne out by the results obtained for the in-school groups. The model also suggests that either the "discouraged worker" effect or the "additional worker" effect may be the dominant factor in cyclical variations in supply.

Further, the results reveal that a seasonal decline in demand invariably brings about a "discouraged worker" effect for students and non-students in the 14-24 age group which, based on other considerations, seems to be an acceptable finding. There are reasons for concluding that a decline in seasonal demand is highly unlikely to result in an "additional worker" effect. In the first place, most people are well aware that seasonal fluctuations in demand recur regularly and this in itself implies that it would be surprising if large numbers of persons were to be drawn into the labour market. Common sense suggests that few people are likely to go out of their way to enter the labour market knowing that jobs are becoming harder to find. The reverse is more likely to be the case: that secondary workers will tend to enter the labour force when they know that their chances of success are greater, thus causing or reinforcing an increase in participation rates in line with the seasonal rise in demand. The short-term duration of financial loss associated with seasonal withdrawal from the labour market also leads one to conclude that an "additional worker" effect would be found only very rarely as a result of a seasonal decline in demand. Fluctuations in income on a seasonal basis are characteristic of many types of employment and are considered routine by those engaged in them. As well, one would expect that unemployment insurance programs and assistance programs associated with unemployment tend to undermine any potential additional worker effect.

Turning to the cyclical demand variable, the results support the "additional worker" hypothesis among students while the behaviour of younger persons out-of-school tends to support the "discouraged worker" hypothesis. This

difference in behaviour can be explained by the very nature of these two sources of labour supply. Students are unquestionably secondary workers while male non-students in the 14-24 age group are not; labour force participation in the case of the latter runs over 90%, i.e., at a level characteristic of primary workers. It is thus not surprising that in the case of the out-of-school groups the “additional worker” effect is much less marked than the “discouraged worker” effect. The same phenomenon accounts for the fact that economic conditions make less of a difference in the case of non-students.

To summarize, the evidence presented in this study suggests that the cyclical demand factor may produce either an “additional worker” or a “discouraged worker” effect among younger persons. The effect that dominates varies with student and non-student status. In contrast, the seasonal demand factor gives rise to a “discouraged worker” effect independent of whether the person is a student or has left school.

APPENDIX A

Regular Questionnaire Used for the

Monthly Labour Force Survey

APPENDIX B

Supplementary Questionnaire Used for the Monthly Labour Force Survey in April 1971

27. ASK FOR ALL PERSONS 14 TO 24 YEARS OF AGE					SUPPLEMENTARY QUESTIONS					
A. Level of schooling completed to June 1971										
Elementary	Secondary (High school)		University		Other post secondary					
Some	Completed	Some	Completed	Some	Degree	Some	Diploma			
1971	1970	1969	1968	1967	1966	1965	1964	Before 1964	Don't know	
B. Year this schooling was completed										
C. Schooling interrupted for more than one year										
No	Yes				Don't know					
D. Presently going to school										
No	Yes				SKIP TO G.					
E. Enrolled for										
Full time	Part time				Don't know					
F. Hours schooling each week										
Less than 8	8-19	20 or more				Don't know				
G. Employment since last September										
No employment	Some employment				Continuously employed					
H. Hours usually worked										
1-8	9-12	13-16	17-24	25-34	35-44	45-54	55-64	65+	Don't know	
I. Without work and looking for work since last September										
No	Yes				END HERE					
J. Number of months										
Under 1 month	1-3 months				More than 3 months					
28. Make comments on all vague, difficult or unusual situations										
If non-interview enter reason										

APPENDIX C

Seasonal Factors in Unemployment Rates for Two Age Groups,
Males and Females, January 1966-April 1973

Year and month	Male		Female	
	14-19 years	20-24 years	14-19 years	20-24 years
1966:				
January	135.7	141.7	107.4	113.0
February	134.0	146.8	91.7	111.5
March	129.2	146.2	93.8	100.0
April	112.2	131.4	90.0	100.0
May	94.4	100.0	96.9	100.0
June	122.3	78.6	160.4	86.4
July	92.9	75.4	110.9	92.6
August	67.0	71.7	88.7	94.3
September	72.3	71.2	101.4	110.3
October	76.7	70.8	92.8	100.0
November	91.7	87.0	85.9	100.0
December	98.8	100.0	79.2	88.9
1967:				
January	132.0	138.2	105.2	111.5
February	130.1	142.1	88.5	109.7
March	127.0	141.4	93.0	106.1
April	111.6	128.4	90.9	100.0
May	95.8	103.4	96.3	97.0
June	121.8	81.8	154.1	91.4
July	95.1	76.4	110.6	88.5
August	67.0	72.1	89.1	93.3
September	72.5	71.4	102.9	115.6
October	78.7	72.5	92.8	100.0
November	90.6	87.5	88.4	94.4
December	97.0	100.0	79.5	87.5
1968:				
January	131.4	132.4	105.1	106.8
February	128.5	139.2	87.7	117.1
March	125.8	137.7	91.2	106.7
April	109.8	128.4	94.7	100.0
May	97.6	106.3	97.3	102.2
June	122.6	83.8	152.7	93.2
July	97.8	77.1	109.3	89.7
August	67.5	74.0	86.2	93.2
September	72.8	72.9	102.6	109.3
October	77.4	73.3	93.5	100.0
November	90.6	87.5	88.4	94.3
December	96.7	98.7	79.5	87.0
1969:				
January	128.5	130.8	107.3	107.7
February	126.6	136.5	91.5	118.4
March	124.6	135.7	88.3	100.0
April	110.6	130.1	95.7	97.0
May	98.5	106.9	96.6	107.3
June	124.4	85.1	152.2	97.0
July	100.0	77.3	108.9	91.4
August	65.8	73.7	86.9	100.0
September	73.1	71.8	102.3	110.8
October	76.3	75.9	93.2	95.3
November	90.2	89.7	89.1	92.2
December	96.0	100.0	81.4	85.7
1970:				
January	127.9	131.3	103.9	112.2
February	125.9	139.7	90.8	114.9
March	123.9	133.3	88.5	100.0
April	113.1	127.0	94.3	93.8
May	100.0	108.3	95.8	111.3
June	122.4	87.5	150.0	96.5
July	99.4	77.7	107.5	94.7
August	67.1	74.8	86.9	100.0
September	73.9	73.5	100.8	108.2
October	75.5	77.4	95.2	96.1
November	91.1	89.2	92.1	94.2
December	96.9	100.0	82.4	84.5

**Seasonal Factors in Unemployment Rates for Two Age Groups,
Males and Females, January 1966-April 1973—Concluded**

Year and month	Male		Female	
	14-19 years	20-24 years	14-19 years	20-24 years
1971:				
January	126.1	129.2	103.3	112.3
February	123.8	129.4	93.8	114.0
March	122.0	131.3	90.1	98.4
April	114.5	125.8	93.8	90.9
May	100.0	108.0	97.3	113.1
June	122.7	87.6	146.8	100.0
July	98.8	78.2	104.8	94.9
August	68.1	75.0	86.6	101.6
September	75.2	74.6	102.4	106.3
October	75.6	77.9	95.8	98.4
November	90.7	89.0	94.0	95.1
December	97.5	100.0	81.2	82.1
1972:				
January	126.8	129.1	104.0	111.1
February	124.2	128.8	94.7	114.5
March	121.9	131.5	89.4	96.6
April	115.2	127.6	95.7	90.0
May	100.0	108.9	98.3	112.3
June	122.4	87.9	148.0	97.2
July	97.9	79.3	103.8	94.4
August	68.1	75.6	86.3	101.5
September	74.7	74.2	101.8	102.9
October	75.9	78.6	96.6	97.0
November	89.9	88.8	94.3	96.1
December	97.0	100.0	80.2	82.2
1973:				
January	126.2	128.9	104.3	111.6
February	124.5	128.0	93.3	113.6
March	123.3	131.0	90.2	96.9
April	115.2	127.8	95.9	91.5

APPENDIX D

**Cyclical Unemployment Rates¹ for the 25-44 Age Group,
Males, January 1965-April 1973**

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1965	3.5	3.6	3.7	3.6	3.5	3.3	3.4	3.3	3.0	2.9	2.8	3.0
1966	3.0	3.0	2.8	2.8	2.7	2.8	2.8	3.0	2.9	2.8	2.8	3.0
1967	3.2	3.3	3.4	3.5	3.5	3.6	3.6	3.5	3.5	3.6	3.9	4.0
1968	4.1	4.3	4.3	4.4	4.3	4.4	4.4	4.1	4.0	3.9	4.1	4.0
1969	3.9	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.9	3.9	4.0	4.0
1970	4.1	4.3	4.5	4.7	5.1	5.5	5.5	5.5	5.5	5.4	5.4	5.3
1971	5.4	5.3	5.3	5.3	5.2	4.9	4.8	4.9	5.1	5.2	5.1	5.1
1972	4.9	4.8	4.7	4.8	4.9	5.2	5.3	5.4	5.4	5.3	5.3	5.1
1973	5.0	4.6	4.3	4.1								

¹ As utilized in the analysis model, i.e., cyclical unemployment rates with irregular movement removed.

APPENDIX E

Non-student Unemployment Rates¹ for the 14-19 and 20-24 Age Groups, Males and Females, January-April and October-December, 1966-73

Year and month	Male		Female	
	14-19 years	20-24 years	14-19 years	20-24 years
1966:				
January	17.5	6.9	7.5	2.6
February	18.3	6.9	6.7	2.8
March	15.7	7.7	6.9	2.3
April	13.8	6.6	6.1	2.2
October	9.0	3.5	7.2	2.7
November	12.0	4.7	7.1	2.7
December	12.0	5.2	6.9	2.4
1967:				
January	18.4	7.7	9.3	2.9
February	18.5	8.3	10.2	3.3
March	18.3	8.4	7.7	3.4
April	14.7	8.5	8.1	3.5
October	12.6	5.0	8.0	3.7
November	15.8	5.6	7.6	3.4
December	18.4	7.6	8.1	3.7
1968:				
January	23.1	10.0	10.9	4.6
February	24.4	11.2	8.9	4.8
March	23.8	10.9	7.9	4.8
April	19.9	9.5	8.8	4.3
October	14.6	5.7	11.1	3.6
November	17.5	7.3	10.3	3.4
December	16.9	7.6	8.6	4.1
1969:				
January	23.7	10.5	10.7	4.2
February	22.7	10.2	10.2	4.6
March	20.1	9.6	10.4	3.3
April	19.0	9.4	10.4	2.9
October	14.9	6.5	11.1	4.2
November	17.0	6.9	11.3	4.9
December	19.3	7.8	11.2	3.7
1970:				
January	26.6	10.7	13.9	4.6
February	25.6	11.6	11.6	5.5
March	21.6	13.5	11.9	4.4
April	26.8	12.8	14.1	4.4
October	17.8	9.0	15.1	5.1
November	21.6	10.8	16.0	5.0
December	25.2	12.0	15.5	5.0

See footnote(s) at end of table.

Non-student Unemployment Rates¹
for the 14-19 and 20-24 Age Groups, Males and Females,
January-April and October-December, 1966-73 – Concluded

Year and month	Male		Female	
	14-19 years	20-24 years	14-19 years	20-24 years
1971:				
January	32.7	16.1	17.0	6.5
February	33.1	15.6	17.1	6.7
March	32.1	15.0	15.5	6.1
April	30.2	15.1	16.0	6.9
October	17.1	8.9	14.9	6.2
November	22.3	9.9	16.3	5.7
December	25.4	11.7	13.3	4.5
1972:				
January	29.0	14.5	17.8	7.2
February	28.2	13.8	16.0	6.4
March	28.3	14.8	16.2	5.8
April	23.2	13.5	15.3	5.4
October	19.1	10.4	15.2	6.6
November	21.7	10.6	14.3	7.4
December	24.7	13.4	12.0	5.9
1973:				
January	28.3	15.2	18.0	7.9
February	26.8	14.2	15.7	6.8
March	23.9	13.4	14.1	6.2
April	22.7	11.4	15.9	6.4

¹ Standard deviation in these unemployment rates is between 5.1% and 10% of the estimate for all groups of non-students except females 20-24 years of age; for this group the standard deviation ranges from 10.1 to 16.5 during the first years of the period. In the case of students, the number of observations on which unemployment rates are based is too small to justify publication. Further, these estimates are derived through Decision Table No. 1 and, therefore, could differ from direct measurement.

SELECTED BIBLIOGRAPHY

Books

ALLINGHAM, John D., "Women Who Work: Part 1", *Special Labour Force Studies*, No. 5, Statistics Canada, Ottawa: Information Canada, 1967, 26 pages.

ALLINGHAM, John D., and SPENCER, Byron G., "Women Who Work: Part 2" *Special Labour Force Studies, Series B*, No. 2, Statistics Canada, Ottawa: Information Canada, 1968, 21 pages.

BOWEN, William G., and FINEGAN, T. Aldrich, *The Economics of Labor Force Participation*, Princeton: Princeton University Press, 1969, 897 pages.

DOUGLAS, Paul H., *The Theory of Wages*, Reprints of Economic Classics, New York: Sentry Press, 1964, 639 pages.

EFROYMSON, M.A., *Mathematical Methods for Digital Computers*, Rolsten and Wilf (eds.), New York: Wiley, 1960, 332 pages.

HUANG, David S., *Regression and Econometric Methods*, New York: Wiley, 1970, 274 pages.

JOHNSTON, J., *Econometric Methods*, New York: McGraw-Hill, 1963, 300 pages.

MINCER, Jacob, "Labor Force Participation and Unemployment; A Review of Recent Evidence" in *Prosperity and Unemployment*, Robert A. Gordon and Margaret S. Gordon (eds.), New York: Wiley, 1966, pp. 73-112.

OSTRY, Sylvia, "The Female Worker in Canada", *1961 Census Monograph Programme*, Statistics Canada, Ottawa: Information Canada, 1968, 63 pages.

SPENCER, B.G. and FEATHERSTONE, D.C., "Married Female Labour Force Participation: A Micro Study", *Special Labour Force Studies, Series B*, No. 4, Statistics Canada, Ottawa: Information Canada, 1970, 102 pages.

WOYTINSKI, W.S., *Additional Workers and the Volume of Unemployment in the Depression*, Committee on Social Security, Social Sciences Research Council, Pamphlet Series No. 1, Washington, 1940, 37 pages.

SELECTED BIBLIOGRAPHY — Concluded

Journals and Periodicals

BONIN, Joseph M., and DAVIS, William Y. Jr., "Labor Force Responsiveness to Short-Run Variations in Economic Opportunity", *The Southern Economic Journal, XXXVIII, No. 2*, October 1971, pp. 161-72.

BUTLER, Arthur D., and DEMOPOULOS, George D. "Labor Force Behaviour in a Full Employment Economy", *Industrial and Labor Relations Review, XXIV, No. 3*, April 1971, pp. 375-388.

Canadian Labour Force Survey (Methodology), Statistics Canada, Ottawa: Information Canada, 1966, 97 pages.

DERNBURG, Thomas, and STRAND, Kenneth, "Hidden Unemployment 1953-1962: A Quantitative Analysis by Age and Sex", *American Economic Review, LVI, No. 1*, March 1966, pp. 71-95.

DUNCAN, Beverly, "Dropouts and the Unemployed" *Journal of Political Economy, LXXXIII*, April 1965, pp. 121-34.

Estimated Participation Rates in Canadian Education, 1968-69, Statistics Canada, Ottawa: Information Canada, 1972, 174 pages.

GENDREAU, Nicole, "Youth Participation in the Labour Force: 1953-70", *Notes on Labour Statistics 1971*, Statistics Canada, Ottawa: Information Canada, 1972, pp. 9-21.

HANSEN, W. Lee, "The Cyclical Sensitivity of the Labor Supply", *American Economic Review, LI, No. 3*, June 1961, pp. 299-309.

KALISKI, S.F., *The Relationship Between Labour Force Participation and Unemployment in Canada: Interim Report on a Pilot Study*, paper presented to the Political Science Association Conference on Statistics, McMaster University, June 1962.

PROULX, Pierre-Paul, "La variabilité cyclique des taux de participation à la main-d'œuvre au Canada", *Canadian Journal of Economics*, May 1969, pp. 268-277.

Seasonally Adjusted Labour Force Statistics, Statistics Canada, Ottawa: Information Canada, 1972, 275 pages.

TELLA, Alfred, "The Relation of Labor Force to Employment", *Industrial and Labor Relations Review, XVII, No. 3*, April 1964, pp. 454-469.



